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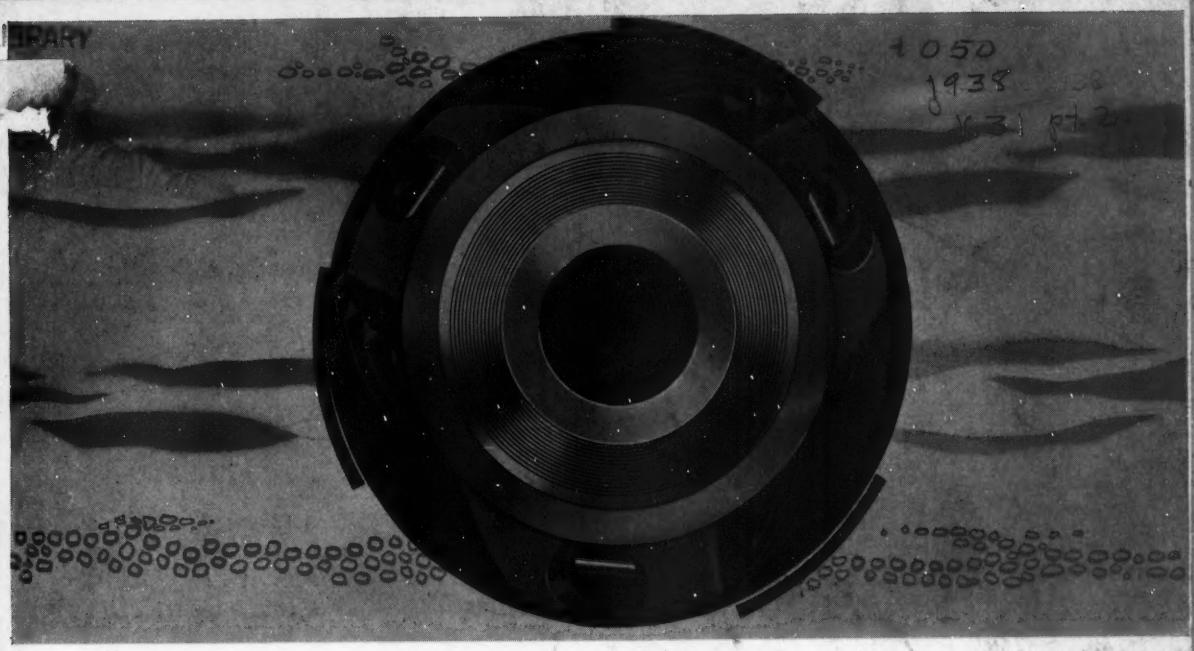

ICE MONTHLY
JULY 5,
1938

Vol. 31
No. 13

Whole
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Photograph by H. A. Erickson, San Diego.

Airplane view of Temblor Range showing the San Andreas Fault bordering Carrizo Plains to the east. Caliente Peak appears near the upper right hand corner.

Eocene In The Tremblor Range; Northwest

Kern County Geologic Features

By GERARD HENNY

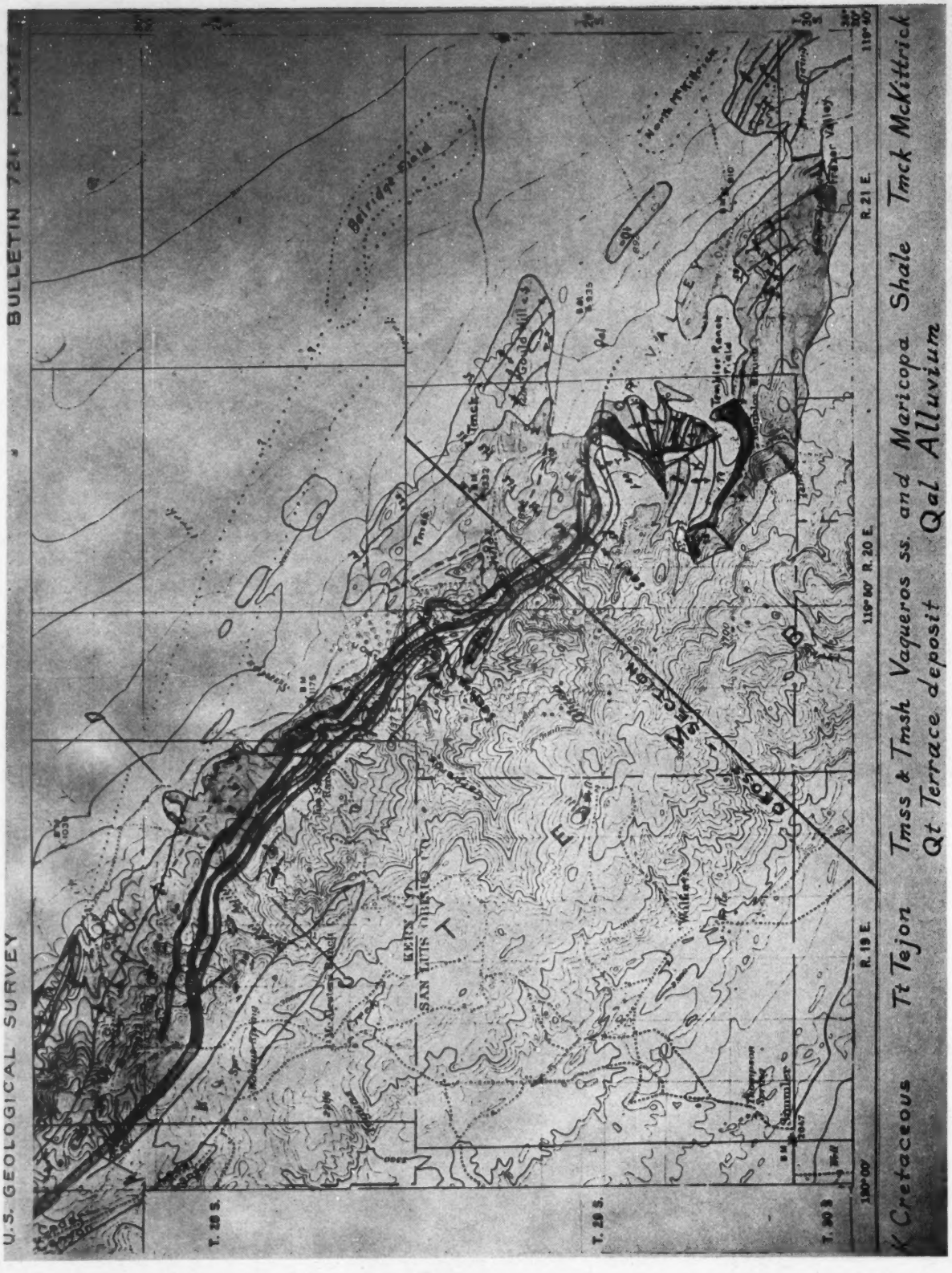
In his article: Eocene of the Coalinga District California Oil World, issues of April 20 and May 20, 1938, the writer described the great unconformity existing at the base of the Santa Margarita, also the one at the base of the Pliocene. In the last article: Eocene of the San Emigdio District (June 5th issue of this magazine)), he points out particularly the spectacular unconformity at the base of the Miocene. This paper is written with the intention to put forward still two other important geologic features occurring in the San Joaquin Valley as well as in California in general. These features are so important because they are encountered in oil wells and the knowledge of them may help while interpreting the results of geophysical exploration. One of the features to be discussed is the local change in facies of certain formations, e.g. the lateral change of a sandstone into a shale. The other feature is the abrupt thinning out of certain formations. Although these phenomena were shown to exist in the districts so far discussed, they are particularly evident in the Temblor Range.

Stratigraphy

For the reader's convenience the writer publishes a copy of part of the map made by English and Kew for Bulletin No. 721, U. S. Geological Survey. As this map was made in 1916, the stratigraphic nomenclature is considered now to be antiquated. In order to conform with the map as much as possible, the writer uses more or less the same terms in the cross-sections with this article. They will serve the purpose.

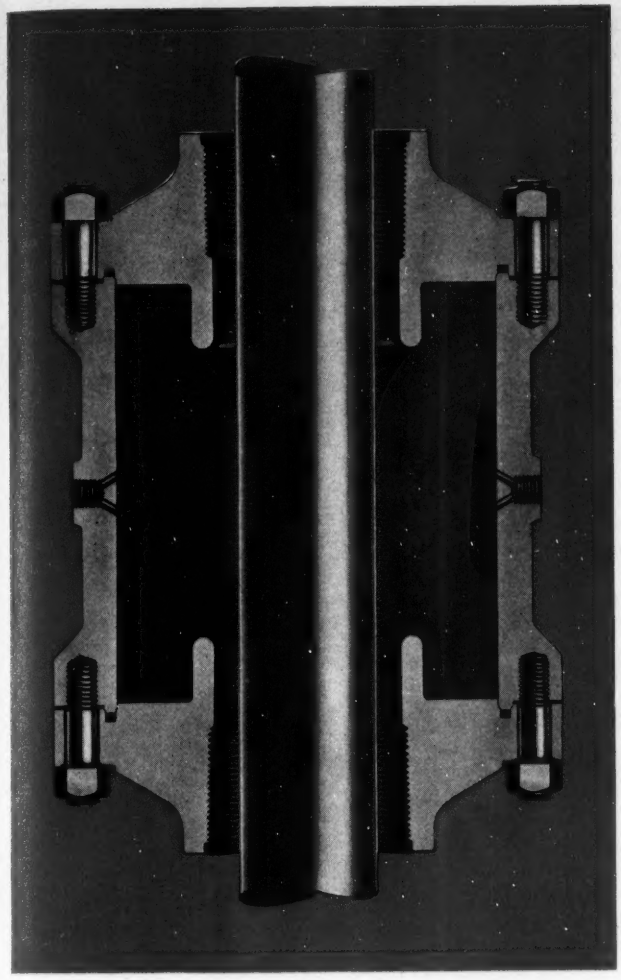
The geologic formations mentioned on the map and cross-section are the follow ing:

McKittrick (Pliocene-Pleistocene) is a generalized name (no more in use) for the Tulare and Etchegoin formations.



Geologic Map of the Temblor Range

Maricopa Shale (Upper and Middle Miocene) is a generalized name for the brown shale of the Temblor Range. In the section of Chico Martinez Creek (see the lowest of the two cross-sections) it consists of more than 5000 ft. of McLure Shale and almost 1400 ft. of Lower Monterey. Note the enormous increase in thickness of the McLure Shale in the Temblor Range compared with the average thickness of 800 ft. in the Coalinga District and of about



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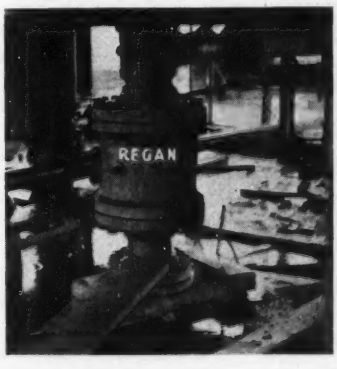
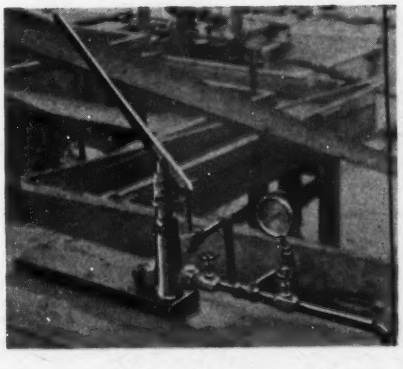


Connected below the derrick floor, Regan Type K Blowout Preventer can be operated by water pressure from boiler pumps, air, tank gas or field gas, if available.



This arrangement provides for the application of pressure at all times on the core pump so leaks can be readily detected. Control and bleed off valves are connected to the core pump at the right..
At the rear the pump connects with the boiler field manifold.

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2000 ft. in the Kettleman Hills.

Temblor (Lower Miocene). The Temblor in the section is the same as the Vaqueros Sandstone on the map. In fact only the lowest 50 ft .of the Temblor in the section is considered to be of Vaqueros age. The total thickness of the Temblor is about 1500 ft.

Dr. Gerard Henny

Eocene. The Eocene in the vicinity of Chico Martinez Creek has a thickness of about 3000 ft. It consists of massive sandstone beds with large canon ball concretions. The map calls this **Eocene:** Tejon; however the sandstone is probably of **Domengine Age.** The writer found some fossils at the base of the Domengine sandstone series in three localities. In one of these, on the ridge south of Agua Media Creek, the fossils were possibly of **Meganos Age.**

Cretaceous. The Cretaceous looks the same as elsewhere in the San Joaquin Valley Region.

General Geology

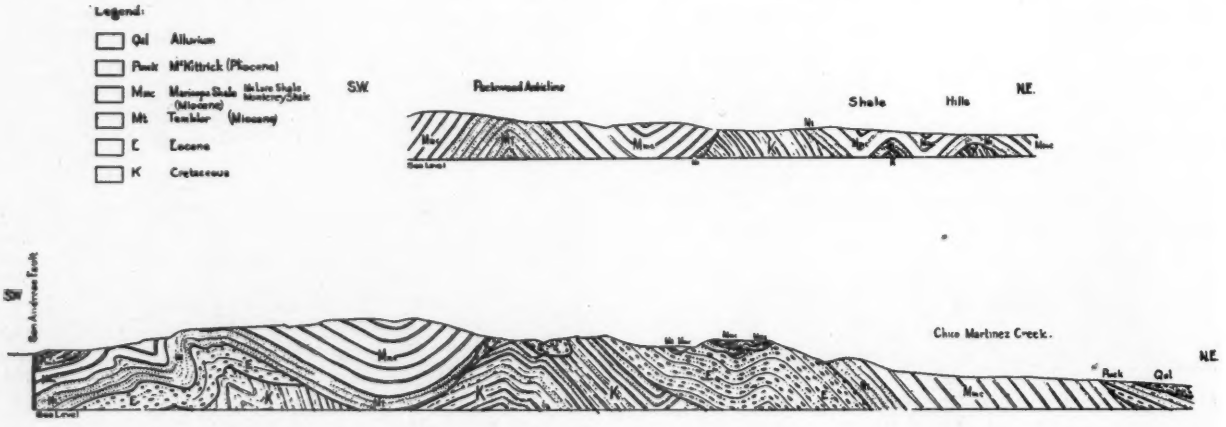
As was mentioned in the introduction of this article, the geology of the Temblor Range is characterized by the rapid thinning out of some of the formations. The lowest of the two sections with this article, the location of which is indicated on the map, shows a 3000-ft. thickness of Eocene near Chico Martinez Creek. This Eocene is lying on Cretaceous which appears at the surface in an anticline. On the southwest flank of this anticline the Eocene is absent nearly everywhere and the Temblor is directly superimposed on the Cretaceous. It is possible that at one time the Cretaceous in this district was completely covered by Eocene, and that the Eocene was eroded from part of the surface in a subsequent period before the deposition of the Miocene. That is why the section shows some Eocene below the Miocene near its southwest end. The presence of this Eocene is however very questionable here. The upper section crosses the Shale Hills at a distance of about 18 miles to the northwest of the lower cross-section. Near the northeast end of this upper section, the McLure Shale lies in many places directly on the Cretaceous. There is no doubt therefore that this formation overlaps all the older ones. At the southwest end of the section, the Temblor suddenly increases in thickness in the Packwood Anticline and only a few miles to the northwest of the Packwood Anticline the Temblor attains a thickness of several thousand feet.

The other point, mentioned in the introduction, the writer wishes to emphasize particularly. In the northwest corner of the map the reader will see the name: **Cedar Canyon.** While doing planetable work in this canyon, the writer followed a sandstone marker bed with fossils at the base of the Maricopa Shale. Towards the northwest he suddenly observed that quite a thickness of shale began to appear below the marker bed. There is no doubt that a change of facies occurs here, the sandstone changing into a shale over a short distance. A similar change of facies was observed by Dr. Goudkoff while studying the cores of wells near Gould Hills (see map), North Belridge, Lost Hills and Kettleman Hills. In the Gould Hills the lower Monterey consists of shales only, but going northward, in the oilfields enumerated above, this Lower Monterey becomes more and more sandy.

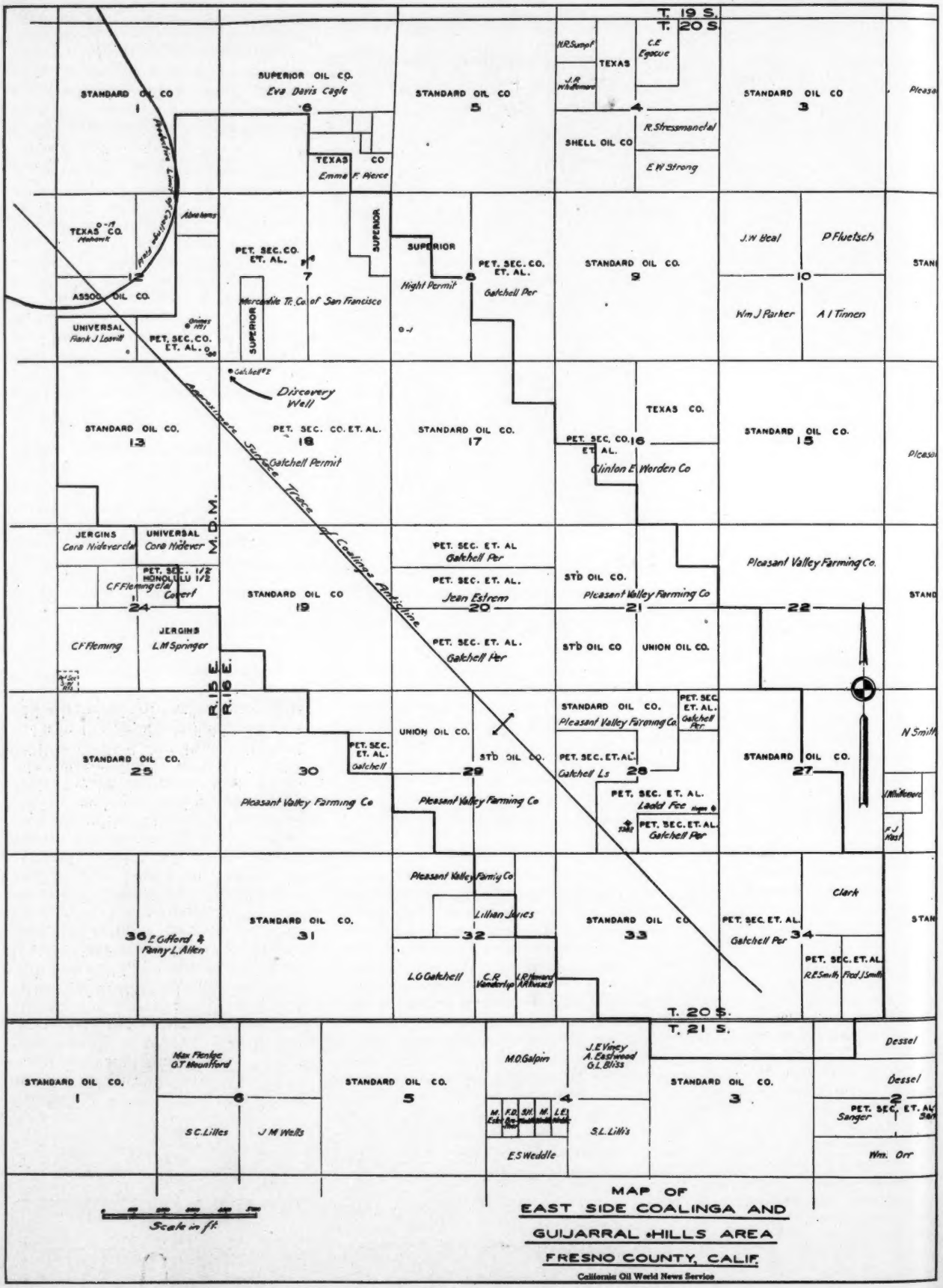
Conclusions

Again the writer wishes to emphasize the importance of the two facts mentioned in this article. The knowledge of the rapid thinning out of certain formations and especially the sudden changes in facies are important for the interpretation of the results of geophysical exploration.

The Eocene Sandstone produces oil only in the old Temblor Ranch Field, in the southwest corner of T29S, R20E. Although the wells in this field are small producers, they prove nevertheless that production can be obtained in the Eocene Sandstone. The wells in the Belridge Oil Field have not yet reached this sand, but it is quite possible that good production may be obtained some day in this horizon in the Belridge District.



SECTIONS THROUGH TEMBLOR RANGE
Kern County, California.
Scale
G. Henny Los Angeles November '931



MAP OF
EAST SIDE COALINGA AND
GUIJARRAL HILLS AREA
FRESNO COUNTY, CALIF.

California Oil World News Service

Controlled Vertical Drilling Development

Outstanding Achievement Of Industry

The old timers who knew where they were by the feel of the screw or the way the fishtail handled were hard to convince that they might be wrong. They took rotary drilling in their stride and if the drill pipe count indicated that it was taking much more footage to reach the formations the fact was accounted one of the drawbacks in the new method of drilling oil or gas wells.

Rotary drilling meant more speed. If the driller worked near the maximum limits of weight on the drill bit he made more hole and that was the most important consideration until things began to happen in Seminole field. Of course, many drillers had discovered much earlier that difficulties attending the completion and production of rotary drilled wells indicated that something was seriously wrong with the drilling method, but it wasn't until wells in the Seminole field, separated by hundreds of yards, began running together that operators began to think of means of checking and controlling the course of the hole.

The Shell Company probably, and the U. S. Bureau of Mines certainly, moved most energetically in the early days toward a solution to the crooked hole problem. Norman L. Dorn, then of the Shell and later to be associated with a highly perfected oil field service devoted to directional well surveying and exact control of directional drilling was active in the earlier development of oil well surveying, beginning with the acid bottle. The acid bottle, now outmoded by far more efficient surveying instruments, told a story recounted thus by Mr. Dorn: "The first surveys showed that many wells had drifted to unfavorable structural positions, and it was often necessary to redrill these wells to obtain production. The straightening or redrilling of these holes was the first stage in controlling the drift of a well. . . . The realization that the wells often drifted off structure caused greater care to be used in drilling operations, and frequent oriented surveys were made during drilling."

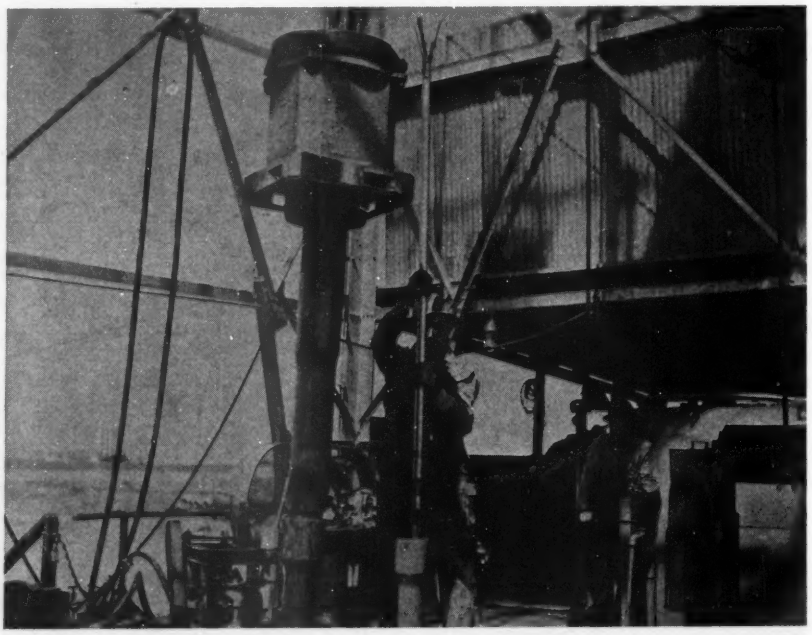
For a number of years efforts directed toward straight hole drilling centered on control of weight on the bit. Later speed of rotation, bit selection, drill stem design, circulation volume and other factors were considered. All of these factors were known to have their effect upon the course of the hole, but a way to combine and use them had to be worked out. Today operators know that accurate knowledge of their effect is gained through frequent inclination readings.

Controlled vertical drilling has become possible because of the high degree of accuracy in the instrument used to get these readings, and a knowledge of the correct use of the information furnished by these records is the controlling factor in such application. Economy in the process of controlled vertical drilling is a natural consequence, particularly when a minimum of time is required to obtain these records and when controlled vertical drilling technique can be practiced as soon as the slightest deviation from vertical occurs.

To say that the efforts of the pioneers in oil well surveying were greeted coldly by the drillers is to place the fact mildly. There was a hostility which can be understood only by realizing that the drilling personnel looked upon the well surveying instruments as "stool pigeons" introduced as checks upon their work. Such was the reception, too, of such indispensable drilling tools as the weight indicator, particularly of the recording type.

No pioneer faced greater obstacles and overcame them more convincingly than J. B. Wood, who introduced one of the first really accurate well drift-recording instruments in the oil fields of California and the Mid-Continent, and specifically made for the purpose of guiding operators in the practise of controlled vertical drilling technique. In 1929 Mr. Wood saw in its crude state the drift recording instrument which he was to bring eventually to its present highly perfected development. His first step was to ascertain the need of the industry for a more effective substitute for the acid bottle. His interviews with administrative officials proved far more encouraging than those with the field men. Those whose wells were shown by Mr. Wood's instrument to have drifted much more than indicated by the acid bottle, could hardly be expected to welcome the new method of well surveying.

His experiences in the oil fields soon told Mr. Wood that he had to go well up in the oil companies' personnels to get results. Although he spoke with fullest confidence when he told the field men that they would soon be using his instrument throughout the Mid-Continent, few of the men in the Oklahoma fields cared to admit that their methods were in error. In some cases where the accuracy of the new surveying method was accepted the difficulty was in convincing the operators that the information gained from the wells would be held in strict confidence. In all cases tact was required to convey to the ope-



Preparing to send inclination survey instrument into the hole. The instrument is a fine precision device which can take lots of punishment.

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The Wonder Oil Field

It was 17 years ago that a small paragraph in The California Oil World announced the spudding in of Alamitos No. 1, which was to discover the wonder oil field of the entire history of petroleum, Signal Hill.

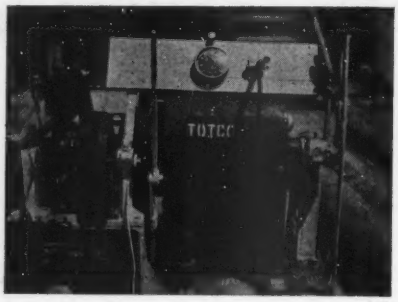
The July 20 issue of The California Oil World will be a special edition devoted largely to the story of Signal Hill and its recent northwest extension. Considerable human interest material which has never been published is being gathered, and all available geological, engineering and technological data are included in the development accounts of the field.

rators the fact that not only were their wells drifting badly but that frequent checks on the course of the hole and resultant modifications in drilling practices would result in savings of time and money.

The derrick drilling system, Mr. Wood pointed out, is a plum bob when properly set up and drilling a straight hole is normal procedure until variations introduced by subsurface pressure differentials cause drifting from the vertical. Subsurface pressure differences can be compensated by control of pressure at the surface, but the adequacy of this compensation can be determined only by periodic drift surveys. The driller who keeps a cross check on the course of his well knows when to increase or lower the pressure on the bit, the rotative speed, the mud volume and weight, and make other changes in operation to assure a straight hole.

Going directly to a man in charge of extensive drilling operations of a major oil company, Mr. Wood startled that individual by telling him that by taking a little more time in drilling to survey wells for drifting considerable time could be cut from that usually required to complete a well. He pointed out the advantages of "straight holes" and asked for the opportunity to test his theories. It was difficult to convince this official that the proposed changes in drilling methods might prove advantageous to the company, but the real problem was to win full cooperation in the field.

In a certain district the wells drilled nearly always encountered a steeply inclined shale stratum which deflected the bit and caused the hole to deflect sharply from the vertical, in some cases necessitating redrilling or abandonment. Challenged to offer some method of correcting the behaviour of wells in this district, Mr. Wood suggested that when the shale was topped the driller should reduce pressure on the bit to a minimum and increase the rotative speed. The plan worked, and in solving the problem of this shale bed Mr. Wood won the support and confidence of the

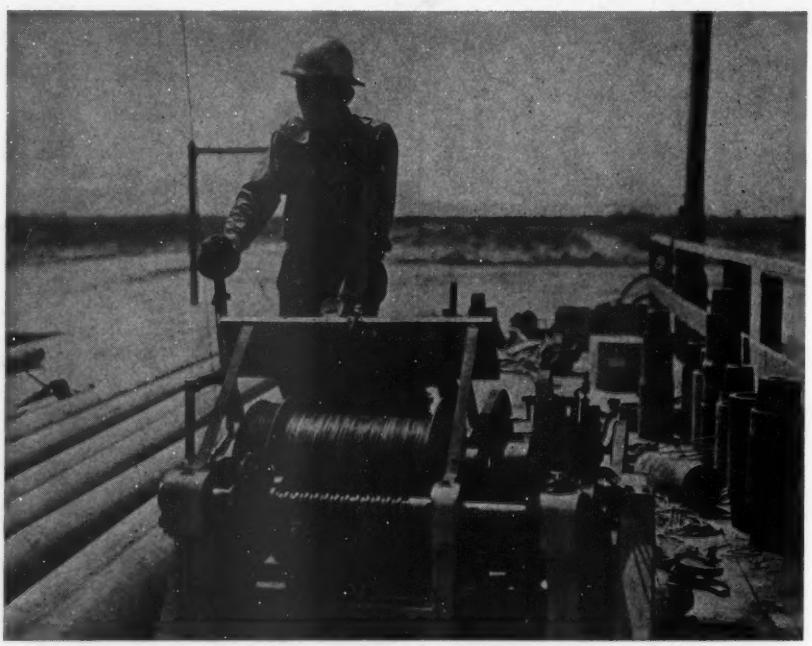


field men. As a result, three drilling wells were then drilled to completion in strict accordance with controlled vertical drilling methods, and in these the average drilling time for wells in the district was reduced by 12 days.

Not content to rest on the achievements which have made his instrument and the methods of controlled vertical drilling developed through its use a necessity in 12 states and four foreign countries, Mr. Wood continues in his efforts to perfect his development, sparing no expense and seeking always the most expert workers in the mechanical and technological arts required in the production of his instrument.

The timing element in his well surveying device, for instance, is of a precision unsurpassed by the finest watches obtainable, and yet is of rugged enough construction to withstand the shocks associated with its use in the well. The pendulum bob which marks the inclination of the hole is another outstanding feature in which an apparently insurmountable obstacle was overcome. The pendulum is so designed that while its movement is perfectly free its motion is quickly damped after the instrument comes to rest at the point at which the well inclination is to be determined. No less noteworthy is the shock absorbing container and the newly developed high speed hoist which permits the recovery of the instrument from the hole as fast as 4000 feet a minute.

In the July 20 issue of The California Oil World the methods and tools used in controlled directional drilling will be discussed. As pointed out by Douglas Ragland, of Humble Oil & Refining Co.,



With this reel the operator can retrieve the inclination survey instrument at a rate as high as 4000 ft. a minute.

Federal ownership of California's rich oil tide lands will again be pressed when Congress reconvenes this fall. California's industry must continue alert to this threat of confiscation.

(Continued from Page 10)

there are two approaches to the directional control of drilling wells: First, methods involving deflection tools which may be oriented so as to produce deflection in predetermined directions, and, second, methods utilizing bit control gained through choice of bit, drilling weight, rotary speed, and drill collar assembly.

Axelson Employes Hold Annual Picnic

Employees of Axelson Manufacturing Co. held their Ninth Annual Picnic June 25, at Montebello American Legion Stadium in Los Angeles.

Heading a diversified program of games, contests, and dancing, Ray M. Humphreys, assistant director of sales, master-ceremonied the entertainment of the 1300 employees and visitors present. Assisting him were Charles Jeffries and a committee of seventeen.

Feature of the day was the baseball game won by the Machine Shop Muscle Men against the Foundry, 9 to 3.

C. F. Axelson, a founder of the company, received a salute in honor of his 74th birthday.

Other events of the day were: Horseshoe pitching contest, tug-of-war, balloon fight, husband calling contest, fat ladies' race, and dancing in the evening.

Tables showing United States employment statistics for the month of March, 1938, have just been released by the U. S. Bureau of Labor Statistics. In the petroleum refining industry the employment index figure for March was 117.7, a decrease of .4 per cent from February, 1938, and a decrease of 2.3 per cent from March, 1937.

New Operator Enters D & B Discovery Area

First operator to enter the new southeast Torrance area opened up by D & B Oil Co.'s 253rd and Vermont completion is F. E. Fairchild who has started work on Block 15 No. 1 at 252nd and Marigold. D & B's discovery well continues to flow 300 bbls. of 30 gravity oil.

Large Gasser Completed By Texaco in Rio Vista

The Texas Co. completed its Midland Fee No. 1 in the southeast portion of the Rio Vista gas field flowing 24,443,000 cu. ft. of dry gas through a one-inch bean. Flow pressure was 1025 lbs. The top of the Emigh zone was found at 3822 ft. and the top of the Ione at 3995 ft. but the lower horizon proved to be wet and was plugged off.

Annual meeting of members of Oil-World Exposition, Inc. and election of directors and officers held at Houston, Texas, in June, 1938

Completing Plans for Houston Show

After making a careful survey as to the desires of those exhibiting at the Houston Oil Show, the executive committee recommended that the next Oil-World Exposition be held in Houston from April 24 to 29, inclusive, 1939. At a meeting of the board of directors this recommendation was approved unanimously and all arrangements made to carry out the plans for the 1939 Show.

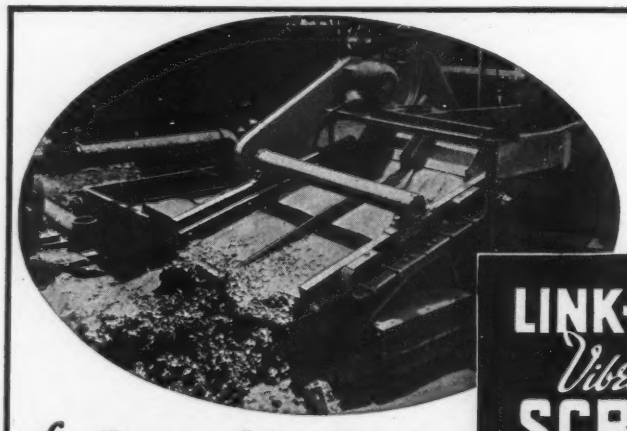
In order to determine the desires of the manufacturers and suppliers of oil equipment, the question was submitted: Do you favor holding the Oil-World Exposition in Houston every two years, alternating with the Tulsa Exposition? Of a total of 221 replies received, 192 companies preferred an exposition held every two years in Houston and every two years in Tulsa. There were 13 companies that wanted the expositions held every four years in Houston and every four years in Tulsa. One manufacturer was satisfied with either arrangement and the rest of those replying to the questionnaire sent out expressed various desires such as a show every 18 months at each city. In all cases there was a desire for an exposition at both Houston and Tulsa.

More than 400 exhibiting spaces in the main building have already been contracted for or reserved for the 1939 Exposition in Houston, announced E. G. Lenzner, general manager of the Oil-World Exposition, Inc. A great number of exhibitors in the 1937 show have increased their space. In order to accommodate the demand for greater exhibiting space, a large annex has been constructed adjacent to the Coliseum where the last show was held. This annex will provide an additional 90,000 sq. ft. of floor space of which 46,000 sq, ft. are on the same level as the main floor of the Coliseum and 44,000 sq. ft. on the ground floor. In addition 13,300 sq, ft. of exhibiting space has been made available in the basement of the Coliseum which will give a total of 184,742 sq. ft. or 938 exhibit booths. The buildings are publicly owned and the exhibitors pay only for the rental of the space.

Approximately 50% additional outdoor space has been provided adjacent to the Coliseum to accommodate the largest exhibits such as derricks, drilling rigs, engines, etc. In addition to the previous outside exhibitors, practically all of whom have reserved space for the 1939 Show, a number of other companies not previously exhibiting have made inquiries regarding large blocks of outdoor space.

Many important meetings and conventions are also being planned to be held during the Exposition. Fifteen meeting rooms have been completed in the Coliseum and a large convention hall is immediately adjacent to this building. The convention hall is air conditioned and is equipped for sound and has projection booths, a 90-foot stage and offers all the facilities desired for any type of meeting. The seating capacity is 2,416.

With every facility offered for the display and demonstration of equipment to the advantage of the men who use tools and machinery in every branch of the oil industry, the Houston Oil Show will bring to the oil men in the very center of the most active oil area in the world the opportunity to inspect and study the equipment that is of vital importance in efficient operation.



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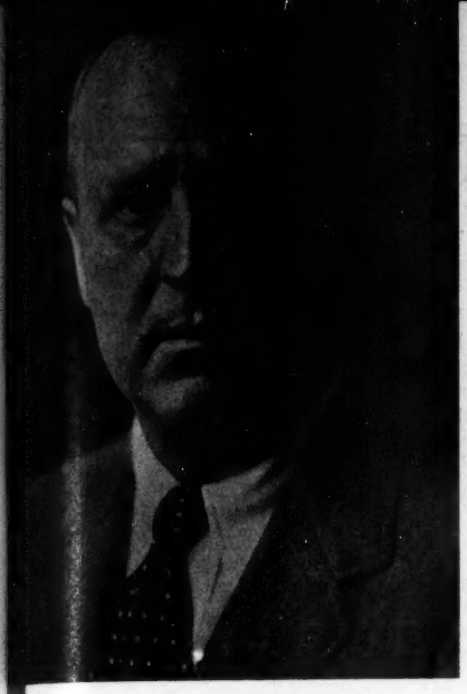


Jack S. Mellon

Equipment Men Dean Is Taken By Death

The passing late in June of Jack S. Mellon, foreign sales manager of Byron Jackson Co., added the dean of internationally known California oil men to the long list of notables taken by death in the first half of 1938.

Mr. Mellon, who was born in Toronto, Canada, July 24, 1887, had a background which logically made him the first person to be sought for advice by oversea visitors in California. American oil and equipment men felt no hesitation in asking his cooperation. He came early to California from his Canadian homeland, attending high school and business college in Pasadena. Until he went with the Dunn Mfg. Co. in 1919, he was in the wholesale machinery business. In the Dunn company he rose rapidly to the position of sales manager, a post he held until the Dunn company was merged with Byron Jackson Co. in 1928, when the expanded organization placed him in charge of their extensive foreign sales.

His travels in the interest of his company made him scores of friends in France, Germany, England, The Hague, Roumania, Peru, Chile and Brazil. His helpful interest in the problems of his fellow California oil and equipment men placed him high in the regard of those who knew him here at home.

Mr. Mellon was a member of the American Legion, Masons, and Jonathan Club. He is survived by his widow, Mrs. Ann Caswell Mellon; a daughter, Helen Louise, and a sister, Mrs. Edith Carns.

Union Names Metcalf Manufacturing Head

Lester G. Metcalf, Union Oil Co.'s manager of refineries for the past eight years, has been appointed director of manufacturing, succeeding R. E. Haylett, deceased, according to a bulletin issued by R. D. Matthews, executive vice president of the company.

Mr. Metcalf is a graduate of Pomona College and Massachusetts Institute of Technology, and first became associated with Union Oil Co. in the Northern Division pipe line department in 1913. He left Union for a time, however, to engage in other activities, and his official record dates from July 5, 1917 when he was employed as refinery engineer at Oleum. He had only a short time in this capacity when his career was again interrupted, this time by the call to active service. After eighteen months in the U. S. Army, he resumed his activities at Oleum refinery, first as machinist foreman, and later refinery engineer. By 1920 he had already begun to display the qualities that have brought him to his present eminence in the company, and in that year was appointed superintendent of the Oleum plant. In this position he remained until 1926 when he was moved to the Los Angeles office as assistant manager of refineries. His promotion to the post of refineries took place in 1930.

"Met," as he is best known to his friends, is a man of inexhaustible energy, a dynamic individual with an unlimited capacity for work. He has been an active member of the Provident Fund Board of Administrators for the past three years, and has always been a potent factor in the shaping and promotion of safety and other employee welfare programs. He is unusually democratic, and rarely misses a picnic, banquet, or other employee affair. He is a top-notch bowler, plays a pretty good game of tennis, frequently indulges in a game of golf, is an expert marksman, with shotgun or rifle, takes a vital interest in the snipe boating proclivities of his children, and, in fact, has such a wide diversity of interests that it is difficult to keep track of them all. It is an interesting indication of his prowess in college athletics that he has more letters than any other graduate of Pomona. During his sojourn at the California school he played varsity football for five years, and, in fact, was an outstanding member of some of its most famous teams. He was also on the track team for five years, and for four successive years played varsity baseball and basketball. He played in the first English rugby game ever staged on the west coast, between The University of Southern California and Pomona in 1906.

Lester G. Metcalf

Apart from his direct company interests, Mr. Metcalf has for many years been active on various technical committees of the American Petroleum Institute, and has been a valuable consultant to other members of the industry on matters pertaining to refinery technology.

Passed by the Senate in 1937 and by the House on the last day of 1938 Congressional session, S. 1131, granting the Navy authority to trade oil lands outside naval reserves for land within the Elk Hills Naval Reserve, is now before the President for signature.

Consideration of an appeal of oil companies challenging the constitutionality of the expropriation law under which the government recently seized $400,000,- in foreign oil properties has been agreed to by the supreme court of Mexico, it is reported.

The continued influx of migrants in California threatens to create labor unrest, greater demand for relief, and higher taxes. The avalanche totaled 105,000 in 1937 and up to April 15 of this year 33,000 have entered the state, indicating an increase of 37 per cent over last year.

Early in the current year Congress enacted a law (Public No. 422, 75th Congress, Chap. 11, 3rd Session, approved January 27, 1938) requiring that any statistical information furnished in confidence to the Bureau of Foreign and Domestic Commerce be held in confidence.

Cement Properties For Well Use Discussed

Most Cement Failures Due To Improper Selection And Application of Material

The following paper is a condensation of a highly interesting presentation which includes further information relating to the background of this subject. The complete paper may be secured by application to the American Petroleum Institute.

By Eugene L. Davis,
The Texas Co.

There are certain properties either necessary or at least desirable in any cement for oil well use. Some of these properties are as follows:

1. It should show a rapid gain in strength after setting. (High ultimate strength is probably not necessary.)

2. Set cement should not shrink or expand appreciably because of heat, moisture or drying and should not crack on dehydration.

3. Cement should set in the presence of sulphate water and resist deteroriation in its presence. This is not necessary on surface casing jobs.

4. Should make a pumpable slurry in cement-water mixes rich enough to take a satisfactory set and develop strength.

5. Slurry should remain relatively fluid after mixing until near time of taking set. It should not form a stiff gel if pumping is halted for a short time while the slurry is being pumped into place.

6. It should not produce excessive heat during setting.

Besides the general properties required of oil well cement, that selected for any specific job should be chosen to take a set as soon as possible after placing and allowing a short extra time period as a safety factor. This is to minimize danger of contamination and interference with setting by gas and formation water. Also, it expedites rig operations. For this purpose its setting time should either be taken at the temperature to which it will be subjected or at a standard temperature and corrected to the effective temperature. In addition its twenty-four hour and four day strength should be determined. These determinations should be made not more than a week before use of the cement is contemplated since the cement in sacks may change appreciably due to hydration in a short time unless carefully stored.

Testing of Cement

Most cement manufacturers are occupied to make A.S.T.M. tests and some other tests demanded by purchaser specifications. A. S. T. M. tests include:

1. Chemical tests for determination of constituents. The oil industry is concerned with the cements' performance only.

EUGENE L. DAVIS

Eugene L. Davis, of The Texas Co., Long Beach, Calif., was born in California in 1896, served in the World War as Ensign in the U.S.N.R.F. After the war, he was employed as mining engineer with the Yukon Gold Co., prospecting for tin in the Federated Malay States until 1921. In 1923 he was granted the degree A.B. in geology by Stanford University. From 1923 to 1925, he was assistant engineer with Chanslor-Canfield Midway Oil Co., at Torrance; from 1925 to 1926 petroleum engineer and geologist with Miley Oil Co., in California, New Mexico, and Colorado; and since 1926 with California Petroleum Corp., and its successor, The Texas Co., as resident petroleum engineer, research engineer, production engineer, and since 1933 district petroleum engineer, with headquarters at Long Beach.

Mr. Davis has been active for many years in Institute district and chapter work in California.

2. Fineness determined by screen anaylsis. We are not concerned with this quality so long as the cement contains no lumps.

3. Setting time of a cement pat of "normal" consistency determined by amount of penetration of a weighted needle. The A. S. T. M. manual advises that the determination of setting time by two testers should check within thirty minutes.

"Normal" consistency is established by an elaborate manual procedure which includes the necessity of mixing several fresh samples until one meets the necessary penetration test. This varies from 15 to 30% water depending on the cement. Mixes in oil well use usually vary between 40 to 50% of water by weight, and would show a slower setting time. The procedure, also, bears no relation to the manner in which cement is used in oil wells since the samples are allowed to stand quietly at room temperature during the tests, whereas oil well cement will nomally be subjected to increasing temperature with depth and agitation due to pumping for a considerable period.

4. Soundness test. Here a cement pat also of "normal" consistency is stored in moist air for twenty-four hours, then in an atmosphere of steam for five hours. Unsoundness is shown by cracking and distortion. Again the application of oil field service is difficult to see.

5. Tensile strength tests. This test bears some relation to our service except that the tests are made at "normal" consistency.

Other tests, not standard, are being made by cement manufacturers to meet the specifications of purchasers. These include: tests to determine the heat of reaction of the cement during setting; tests of the swelling and shrinking of cement bars under varying conditions of heat and moisture; tests of the resistance of cement bars to sulphate water.

None of these tests cover the most important point from the standpoint of the oil producer, that is, the setting time or thickening rate of pumpable slurries of neat cement.

The oil industry has always suffered from the failure of cement jobs. For various reasons we have had a certain percentage of failures. But until the drilling of deep, hot wells at Santa Fe Springs very few of these failures were attributable to any curable fault of the cement itself.

Here, in 1929, in the Clark zone below 7,000 ft., a large number of failures of shut-off and coring of crumbly cement led a cement chemist, Otis D. Small of the Pacific Portland Cement Co., to doubt the applicability of the quick setting oil well cements then in use to the cementing of deep wells. He devised a tester from an ice cream freezer to test the setting time of slurry in a hot bath with continuous stirring. His experiments showed that temperature was a much more effective accelerant of the setting

THICKENING RATE · CURVES

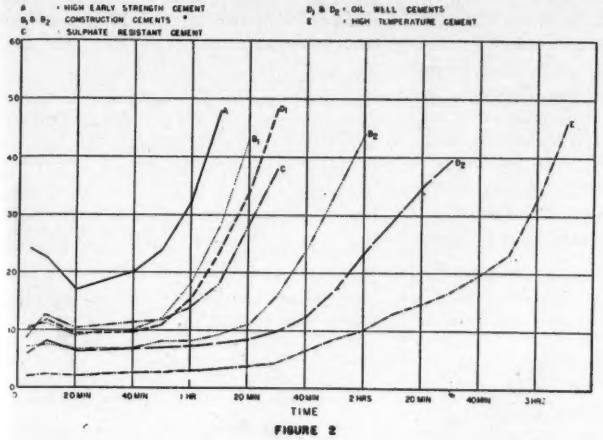


FIGURE 2

The cement manufacturers have the equipment and personnel to meet our requirements. They have shown their willingness to cooperate with cement users by meeting with very exacting specifications in recent construction projects. From previous experience we can predict with confidence that this cooperation will be beneficial to both industries and lead to improvement in the qualities of cement and in the manner of its use. This paper would be incomplete without acknowledging the assistance furnished by various cement chemists and petroleum engineers. I owe special gratitude to W. W. Robinson who furnished all the test data.

THICKENING RATE CORRECTION FOR TEMPERATURE

Effective Placement Temperature

Placement Time	120°F.	140°F.	160°F.	180°F.	200°F.	220°F.	240°F.
15m				1h	1h		
30m				1h30m	1h30m	1h30m	1h30m
45m		1h	1h	2h	2h	2h15m	2h30m
1h	1h	1h15m	1h30m	2h30m	2h30m	2h45m	3h
1h15m	1h15	1h30m	2h	2h45m	2h45m	3h	
1h30m	1h30m	1h45m	2h15m	3h	3h		
1h45m	1h30m	2h	2h30m				
2h	1h30m	2h15m	2h45m				
2h15m	1h30m	2h30m	2h45m*				
2h30m	1h45m	2h45m	2h45m*				
2h45m	2h	2h45m					
3h	2h15m	2h45m*					
3h15m	2h15m						
3h30m	2h30m						
3h45m	2h45m						
4h	2h45m						
4h15m	2h45m						
4h30m	2h45m*						
4h45m							
5h							

Body of table gives minimum necessary 140° standard thickening rate

Safety factor, 15 min.

"Ese cement with 2hr5m standard 140° thickening rate test only.

Example: Given placement time 56 min. at assumed effective temperature 180°. To select cement at standard test conditions:

From 1 hr. in Placement column, find horizontal equivalent under column headed 180°. This figure (2 hr.) is the thickening rate of the desired cement at 140° standard test. That is, this cement with a thickening rate of 2 hr. at 140° will have a thickening rate (pumpable limit) of 1 hr. 15 min. at 180°. This leaves a 15-min. safety factor.

Fig. 4

time than chemicals and indicated that the failure of the cement was due to the fact that the cement had been agitated beyond its setting time and had, hence, failed to bond together after placement. Attributing cement failure to high pressures is an error. The effect of pressure on cement setting is negligible.

This led to the changing of most oil well grades of cement to a slower setting type. But the shallow wells still are being drilled and some manufacturers still make a fairly quick setting "oil well" grade.

This difference in the setting properties of oil well cements, which operators have been largely unaware of, has led to a great deal of confusion and dissatisfaction. So much so, that in the few years past there has been a considerable search for a substitute for Portland type cement. No satisfactory substitute has been found.

Another line of research has been that of studying the properties of the available cements in order to use them more efficiently, and select the right one for a given job.

Summing up the balance sheet of Portland cement we find the following good qualities: it forms an excellent bond to steel; it has excess strength; it is cheap, it costs less than one cent a pound. On the other hand, it has a number of undesirable qualities. It may fail to set due to: agitation by gas, by movement of fluids in the well or by pumping after it has taken a set. It may make an unsound set due to contamination by mud or formation water or to improper mix. It may check or crack on dehydration or may disintegrate in contact with well waters.

This is an impressive list of faults, however all but the agitation by gas and well waters are conditions which can be corrected by intelligent control of well conditions and careful testing of the cement itself. Adequate testing of the cement will eliminate danger from that source and limit the chance of failure to the well itself.

This brings us to the conclusion that a substantial percentage of the failures of cement jobs are really the fault of the user. The operator can improve his results by knowledge and diligence but, since he is not equipped to test the cement, he cannot get a satisfactory solution without the cooperation of the cement manufacturer in disclosing the essential properties of his product. We have reason to believe that the cement industry will be glad to cooperate if the oil industry requests it.

We do not propose to tell the cement manufacturer how to make cement, or even to require him at least for the present, to make a long series of grades. Already existing grades, regularly made by various plants, fill the demands that we are likely to make although probably few single manufacturers now make all desirable grades.

We suggest, for the present, that they continue to make their same grades, but that they give us certain guiding markings that will permit us to select cement to suit the job. This marking should be as simple and significant as possible.

We have seen that the A.S.T.M. tests yield little usable information, but that the "ice cream freezer" test showed promise. Fortunately, after the experiments by Small, the apparatus was taken up by Messrs. Silcox and Rule of the Standard Oil Co. of California, who developed the device to a high degree of perfection and established a standard testing procedure.

A 40% slurry, that is, one containing 40% as much water as cement by weight, is generally used. Experiments are now made using a standard pumpable viscosity of slurry, but the 40% mix will be considered as standard for the present. High early strength cements require more dilution to make a fluid mix, at least 45%.

Starting at 60 r.p.m. and 80° F., the temperature is raised 1° a minute for 60 minutes or to a temperature of 140° where it is maintained for the duration of the test. In the meantime, the speed of agitation is reduced to 14.5 r.p.m. at the end of twenty minutes and maintained at that speed. The drag on the cylindrical container set up by the friction and adhesion of the thickening slurry as it is stirred by the rotating impeller blades is measured on a spring balance. At a forty ounce pull the point of initial set is considered to be reached. At this point the torque curve is rising rapidly and the slurry is so thick as to be practically unpumpable. For this reason, this point is really more usable than the actual set-

ting point. The elapsed time up to this point is called the "thickening rate" of the cement. (Fig. 2)

Different observers usually check this point within two or three minutes as compared to thirty minutes on the A. S. T. M. setting point test.

Tests of different types of cements at

THICKENING RATE TESTER

Showing, in left foreground, cylinder container; center foreground, stirring assembly; right, top of container and driving gears. Operator is inserting thermostat in water bath.

various temperatures give data on which thickening rates of cement tested under standard conditions can be interpolated to any temperature with reasonable accuracy.

With this data the engineer can select the cement to fit his job. All he needs is the time it will take to mix and place the cement and the effective temperature to which it will be subjected. For quick computation of mixing and placing time nomographic charts have been devised. (Fig. 3). Underground temperatures vary considerably from field to field and should be determined by test. The average effective temperature will be somewhat less than that of th formation but higher than that of the circulating mud. A high average between the two is usually assumed as the effective temperature.

Charts for computing placement time and correction of thickening rate for temperature (Fig. 4.) can easily be inserted in the cementing booklets furnished by cementing service companies. This table was worked up by W. W. Robinson of the Texas Co. With these data handy the operator or petroleum engineer can plan his cement job and select the cement to be used provided he knows its thickening rate under standard test conditions.

We suggest then, that cement to be sold for oil well use, regardless of whether it is now rated as an "oil well" cement, have its thickening rate plainly marked on the sacks. If sulphate resistant it should also state that fact, for instance, that it meets certain accepted specifications for sulphate resistance. Later some standard test should be adopted. All such cements should pass minimum tensile strength tests of 350 pounds/sq. in. in 24 hours and 450 pounds/ sq. in. in 4 days at a curing temperature of 150° F. In addition the set bars should not distort or crack due to heat or dehydration.

Ultimately these cements may be grouped for convenience into about four groups as follows:

Group 1. High early strength cements, not necessarily sulphate resistant, primarily for use on surface pipe. Thickening rate, one hour.

Group 2. Cement with thickening rate of about one hour and fifteen minutes to one hour and forty minutes. Sulphate resistant construction cements and some oil well cements are available in this class. With accelerants these cements may be substituted for those in group No. 1.

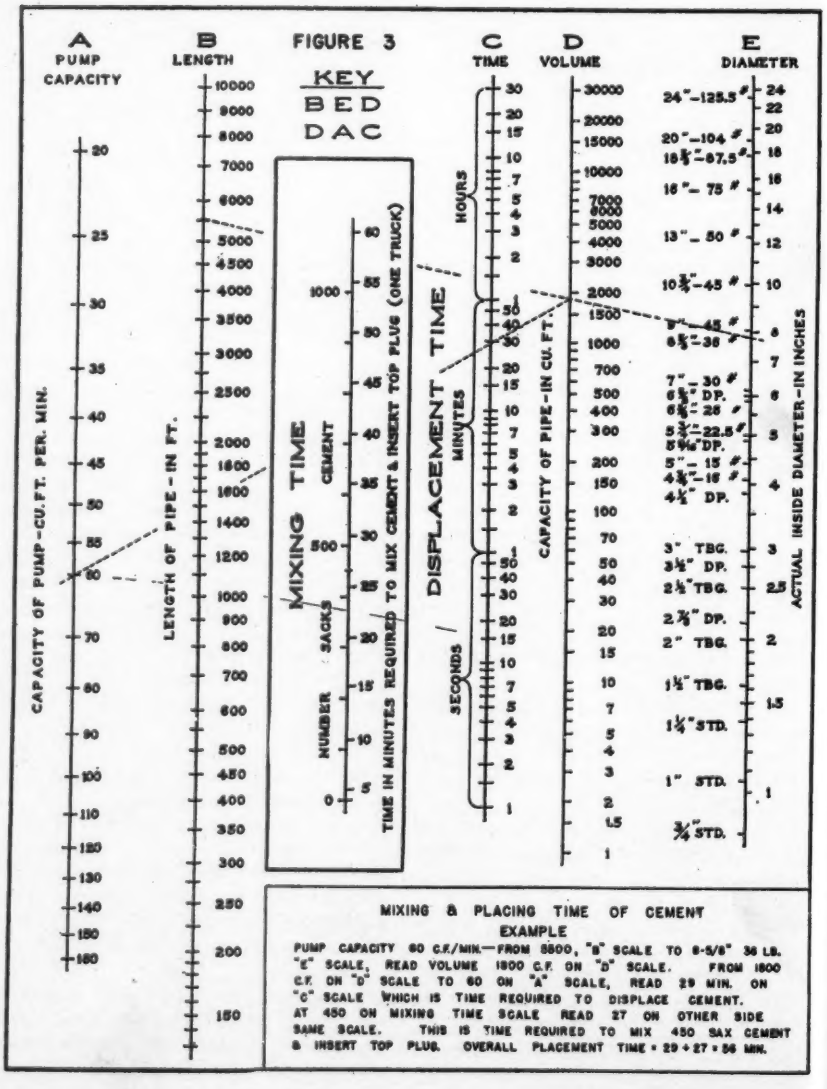
Group 3. Cement with thickening rate of one hour and forty minutes to two hours and twenty minutes. Sulphate resistant. Most oil well cements are in this thickening rate group.

Group 4. Cement with thickening rate of above two hours and twenty minutes. Sulphate resistant. High temperature type cements and a few oil well cements are in this group.

Conclusions

That there is a need for establishing some specifications for oil well cement cannot be denied. The first move in this direction must be made by the oil industry, preferably by its most representative body, the American Petroleum Institute.

FIGURE 3


KEY
BED
DAC
A
PUMP CAPACITY
CAPACITY OF PUMP-CU. FT. PER. MIN.
B
LENGTH
LENGTH OF PIPE - IN FT.
MIXING TIME
CEMENT
SACKS
NUMBER
TIME IN MINUTES REQUIRED TO MIX CEMENT & INSERT TOP PLUG (ONE TRUCK)
DISPLACEMENT TIME
C
TIME
HOURS
MINUTES
SECONDS
D
VOLUME
CAPACITY OF PIPE - IN CU. FT.
E
DIAMETER
ACTUAL INSIDE DIAMETER - IN INCHES
MIXING & PLACING TIME OF CEMENT
EXAMPLE
PUMP CAPACITY 60 C.F./MIN.—FROM 8800, "B" SCALE TO 8-5/8" 36 LB. "E" SCALE, READ VOLUME 1800 C.F. ON "D" SCALE. FROM 1800 C.F. ON "D" SCALE TO 60 ON "A" SCALE, READ 29 MIN. ON "C" SCALE WHICH IS TIME REQUIRED TO DISPLACE CEMENT. AT 450 ON MIXING TIME SCALE READ 27 ON OTHER SIDE SAME SCALE. THIS IS TIME REQUIRED TO MIX 450 SAX CEMENT & INSERT TOP PLUG. OVERALL PLACEMENT TIME = 29 + 27 = 56 MIN.

PRODUCTION :-: DEVELOPMENT

(Figures of Production and Stocks are in barrels of 42 Gals.)

	Total Production May	—DAILY AVERAGE— May, 1938	April, 1938	May, 1937
Group No. 1				
Belridge—North	380,174	12,264	15,843	15,144
Belridge—South	32,253	1,040	1,174	1,653
Canal	56,713	1,830	1,856	.....
Canfield Ranch	3,911	126	138	.....
Coalinga	310,741	10,024	13,129	16,418
Edison	89,632	2,891	3,537	4,262
Elk Hills	335,147	10,811	11,120	11,116
Fruitvale	286,886	9,254	9,260	9,448
Greeley	107,661	3,473	3,304	861
Kern River	395,741	12,766	13,348	15,899
Kettleman Middle Dome	1,686	54	60	149
Kettleman North Dome	2,218,542	71,566	80,957	81,036
Lost Hills	113,343	3,656	3,830	3,801
McKittrick	102,286	3,300	3,803	4,037
Midway-Sunset	1,962,987	63,322	65,935	75,130
Mountain View	374,635	12,085	12,211	19,282
Mount Poso	596,426	19,240	19,420	16,272
Rio Bravo	100,740	3,250	3,123	.....
Round Mountain	487,867	15,738	16,731	11,470
Ten Section	184,397	5,948	6,155	2,509
Wasco	20,638	666	389	.....
Wheeler Ridge	9,559	308	314	334
Group No. 2				
Capitan	88,573	2,857	3,068	2,433
Elwood	209,475	6,757	6,611	9,161
Rincon	138,586	4,471	3,827	2,755
San Miguelito	85,819	2,768	2,965	3,151
Santa Barbara	14,059	454	442	743
Santa Maria	433,920	13,997	17,805	10,460
Summerland	1,078	35	29	37
Ventura Avenue	1,122,947	36,224	37,114	35,094
Ventura-Newhall	154,479	4,983	5,170	4,992
Watsonville	1,240	40	40	60
Group No. 3				
Brea-Olinda	177,387	5,722	5,927	8,723
Coyote—East	110,120	3,552	3,560	4,141
Coyote—West	275,699	8,894	8,998	8,795
Domingues	840,169	27,102	26,737	24,687
El Segundo	341,815	11,026	14,418	5,569
Huntington Beach	1,027,767	33,154	34,193	36,939
Inglewood	460,043	14,840	15,924	16,049
Lawndale	2,868	93	71	86
Long Beach	1,800,062	58,067	58,185	60,523
Los Angeles-Salt Lake	16,245	524	553	787
Montebello	330,958	10,676	8,551	9,377
Playa del Rey	208,055	6,711	6,763	9,283
Potrero	14,037	453	416	314
Richfield	282,293	9,106	9,674	8,278
Rosecrans	211,119	6,810	6,905	2,951
Santa Fe Springs	1,123,630	36,246	37,298	44,531
Seal Beach	273,218	8,813	9,476	9,709
Torrance	364,116	11,746	9,607	7,849
Whittier	28,799	929	945	917
Wilmington	3,036,409	97,949	100,672	39,741
Total	21,346,950	688,611	721,581	656,951
April	21,647,430	721,581		
Decrease	300,480	32,970		

STOCKS HELD IN PACIFIC COAST TERRITORY BY CALIFORNIA OIL COMPANIES

	May 31, 1938	April 30, 1938	May Changes	Dec. 31, 1937 Reclassified
1. Fuel Oil Residuum and Non-Gasoline-Bearing Crude	81,652,079	79,873,516	+1,778,563	68,529,388
2. Gas Oil and Diesel Oil	9,297,687	9,361,306	− 63,619	8,648,990
3. Gas.-Bearing Crude	31,529,797	31,376,515	+ 153,282	29,417,842
4. Unblended Nat. Gas.	2,913,534	2,689,376	+ 224,158	2,001,204
5. Gasoline (not including distributing and service stations)	13,895,109	14,729,793	− 834,684	13,520,678
6. Naphtha Distillates	1,628,985[1]	1,663,567[1]	− 34,582	1,464,577[1]
7. All Other Stocks	5,617,159[2]	5,275,209[2]	+ 341,950	4,457,568[2]
TOTAL	146,534,350	144,969,282	+1,565,068	128,040,247
Estimated amount of unfinished gasoline contained in item 6	1,425,807	1,438,878		1,248,291
Coke included in item 7	20,434	20,329		22,435

	New Rigs Up	Active Drilling	Producers Completed	Daily Initial Output	Active Producing	ABANDONED WELLS Drillers	Producers
Group No. 1							
Belridge—North	1	5	2	1,924	61	....	....
Belridge—South	..	....	1	25	85	....	....
Canal	1	1	2	4,355	7	....	....
Canfield Ranch	..	1	....	....	1	....	....
Coalinga	..	4	....	..	850	....	....
Edison	..	1	....	....	88	....	....
Elk Hills	..	....	....	....	173	....	....
Fruitvale	1	2	1	411	166	....	....
Greeley	1	2	1	285	13	1	....
Kern River	2	3	2	50	1,358	....	....
Kettleman Middle Dome	..	....	....	....	3	....	....
Kettleman North Dome	1	15	3	3,781	192	....	....
Lost Hills	..	3	....	....	226	....	....
McKittrick	..	2	....	....	193	2	....
Midway-Sunset	1	4	2	71	2,475	....	5
Mountain View	1	1	....	....	194	1	....
Mount Poso	1	4	3	573	292	2	1
Rio Bravo	5	9	2	11,050	7	....	....
Round Mountain	4	4	4	2,094	182	2	....
Ten Section	4	3	3	9,656	20	....	....
Wasco	3	1	....	....	1	....	....
Wheeler Ridge	..	1	....	....	22	....	....
Group No. 2							
Capitan	1	1	2	259	44	....	....
Elwood	..	....	....	....	80	....	....
Rincon	1	2	1	241	42	....	....
San Miguelito	1	....	....	....	16	....	....
Santa Barbara	..	....	....	....	34	....	....
Santa Maria	3	11	11	12,639	296	1	....
Summerland	..	....	....	....	18	....	....
Ventura Avenue	3	10	2	1,145	228	....	....
Ventura-Newhall	..	7	....	....	549	....	....
Watsonville	..	....	....	....	7	....	....
Group No. 3							
Brea-Olinda	..	1	....	....	330	....	....
Coyote—East	..	....	1	250	85	....	....
Coyote—West	..	....	2	319	49	....	....
Domingues	2	2	2	824	186	....	....
El Segundo	1	2	1	800	61	1	1
Huntington Beach	1	2	....	....	566	....	2
Inglewood	..	....	....	....	205	....	....
Lawndale	..	....	....	....	6	....	....
Long Beach	2	7	5	992	1,258	....	1
Los Angeles-Salt Lake	..	....	....	....	113	....	....
Montebello	5	8	5	9,054	221	1	....
Newport	1	1	....	....	....	....	....
Playa del Rey	..	....	....	....	198	....	....
Potrero	..	....	1	510	12	....	....
Richfield	4	4	1	50	293	....	1
Rosecrans	2	2	3	2,761	94	....	4
Santa Fe Springs	..	....	....	....	647	....	4
Seal Beach	..	....	....	....	109	....	....
Torrance	13	15	....	....	530	....	....
Whittier	..	....	....	....	131	....	....
Wilmington	27	25	33	49,232	493	1	....
Miscellaneous Drilling	12	45	....	....	....	8	....
Group 4—Gas Fields							
Buena Vista Lake	..	1	....	....	5	....	....
Buttonwillow	..	....	....	....	12	....	....
Chowchilla	..	....	....	....	....	....	....
Delano	..	....	....	....	....	....	....
Dudley Ridge	..	....	....	....	....	....	....
Goleta	..	....	....	....	....	....	....
McDonald Island	..	....	....	....	4	....	....
Rio Vista	..	1	....	....	12	1	....
Semi-Tropic	..	....	....	....	....	....	1
Tracy	..	....	....	....	1	....	....
May	106	213	96	113,352	13,553	21	20
April	107	225	89	88,604	13,563	21	19
Decrease (*Increase)	1	12	7*	24,748*	30	....	1*

LAUGH THIS OFF

Well, folks, the papers tell us that the price of living is coming down. Now, if we could only get the merchants to read the papers!

Speaking of newspapers, **Doug Balthis** used to tell a story about Horace Greeley, one of the greatest newspaper men of his time. It seems Horace was always arguing that the word "news" was singular. He sent a reporter out on an assignment once, and after he had been on the job for a couple of days, sent his a brief wire, asking, "Any news?" The reporter wired back, "Not a single new."

One local paper, incidentally, carries an ad for a dry goods house, reading, "Wonderful bargain in work shirts for men with sixteen or seventeen necks."

And according to **Earl Cooper**, they are now equipping the late models of the bigger cars with Austin swatters.

Max Anfenger here interrupts to introduce a suggestion that the well-known slogan be changed to read, "Stop! Look! and Live!"

While **Leon Barrett**, the impressario of the links, says that golf is one of the finest physical exercises. It's a whole lot better, he opines, to swat pills than to swallow them.

And an oil executive who shall be nameless is so run down that he has been ordered to give up his golf and go back to work.

Roy Benson was interviewing another applicant, and as usual asked him to give some account of his past history. "Well", the lad explained with becoming honesty, "I haven't had much of a past, but my future is spotless."

Now comes **Chap Perry**, telling us that there are no elevators in the Masonic Building. That's one place where the lads always go up by degrees.

And says **Bill Ferrand** to the equipment salesmen, "Okay, call again about Thankgiving, and we'll talk turkey."

Bill informs us also that there are a couple of brothers by the name of Berger in the oil fields up at Santa Paula. Their buddies have nicknamed them "Ham" and "Lim."

Then there was the lad who worked in the transportation department, and told all his friends he was in the movie business.

Bill Roper was in a cafe at Avenal, when a minister came in and sat down beside him. After the waitress had taken his order she asked, "And how will you have your steak done, sir?" Without hesitation the clergyman replied, "Well done, thou good and faithful servant."

By the way, food is so scarce in certain parts of the East that we read the other day where a man had lived on garlic alone for three weeks. Well, any man that eats garlic should live alone!

Miller Huggins is of the decided opinion that the best wrestler in the whole world is Little Jo. It takes a mighty smart man to throw Little Joe.

And speaking of his buddy, the rousty informed his hearers, "Aw, Bill is a swell guy. I've known him for years. He used to be my running mate in the war."

We are just in receipt of a distressing report from **Bob Keyes** to the effect that a chap up in Fellows suffered a bad attack of pneumonia after working in an open shop.

An oil man, who shall be nameless, confided to the hotel clerk that he had been kept awake all night with insomnia. "That's funny," said the clerk, "We just had the whole place disinfected a week ago."

Which brings us once more to the end of a rather useless effort. Remember if you want to make a living, you must work for it, but if you want to get rich you must find another way.

And, in conclusion, don't forget, there is nothing like a good automobile accident to make you forget your other troubles.

THE ULTIMATE IN CEMENTING EFFICIENCY IS AFFORDED BY THE BAKER

Complete details will be found in the Baker section of your Composite Catalog.

CEMENT WASH-DOWN WHIRLER FLOAT SHOE

State Drilling Report

Field	Company	Well	No.	Sec.	Twp.	Range
NEW WELLS						
Rosecrans	Barnsdall Oil Co.	Rosecrans	9	20	3S	13W
	The Superior Oil Co.	Callender	1	20	3S	13W
Montebello	Standard Oil Co.	Standard-McDonald	1	2	2S	12W
	McVicar-Rood	Mans	2	2	2S	12W
Los Angeles County	Tidewater Assoc. Oil Co.	Porter	1	27	3N	16W
Piru	Charles McKinnis		1	14	4N	19W
Ten Section	Shell Oil Co.	KCL-A	67–30	30	30S	26E
	Shell Oil Co.	KCL-B	2–32	32	30S	26E
	Shell Oil Co.	KCL-A	61–29	29	30S	26E
Torrance	Consolidated Petroleum Co.	Torrance	2	23	4S	14W
	Morton & Elder	Mitchell	1	23	4S	14W
	Hampshire Oil Co.	Hampshire	1	23	4S	14W
	W. E. McCaslin	McCaslin	2	14	4S	14W
	Hujo Oil Co.		1	23	4S	14W
	Star Pet. Co. of Calif., Ltd.	G & A	2	23	4S	14W
	Ivar Larson	Ramsey	1	23	4S	14W
	Elexico Oil Corp.	Allen-K	2	23	4S	14W
	Packard Petroleum Corp.	Lomita	2	23	4S	14W
Coyote Hills	Severns Drilling Co., Ltd.	McNally	1-A	24	3S	11W
El Segundo	Soverign Oil Corp.	Elsie	2	12	3S	15W
Ventura	Lloyd Corp., Ltd.	Lloyd Corp.	2	23	3N	23W
Ojai	Holly Development Co.	Macrate	1	27	4N	23W
Capitan	Shell Oil Co.	Covarrubias 1, 27, 28 and 29		32	5N	30W
Santa Maria Valley	Hancock and Bush	Calif. Lands	3	30	10N	33W
Round Mountain	Honolulu Oil Corp.		47	20	28S	29E
	Shell Oil Co.	Olcese Five	2	22	28S	29E
Rio Bravo	Union Oil Co.	Kernco	5–34	34	28S	25E
Fruitvale	Western Gulf Oil Co.	37-KCL-B		14	29S	27E
Kern River	Helm & Smith	5-A		34	28S	28E
	Kern Oil Co., Ltd.	25-3C		25	28S	27E
San Bernardino Co.	So. Counties Pet. & Drlg. Corp.		1	22	2S	8W
Wilmington	The Hancock Oil Co.	Harbor	C–25	2	5S	13W
	General Petroleum Corp.	Harbor Comm.	45	2	5S	13W
Fresno County	Dauphin Development Corp.		1	19	21S	14E
Canal	Shell Oil Co.	Canal A	52–14	14	30S	25E
Kern County	Continental Oil Co.	KCL	B-2	12	29S	26E
Mt. Poso	Shell Oil Co.	Matthew Fee	7	4	27S	28E
Greeley	Standard Oil Co.	K.C. 12	5	7	29S	26E
Kettleman North	K.N.D.A.		27 & 58	8	22S	18E
DEEPEN OR REDRILL						
Huntington Beach	M. K. F. Oil Co.		5	2	6S	11W
	Standard Oil Co.	Huntington H	19	10	6S	11W
Elwood	Barnsdall Oil Co.	Luton-Bell	8	15	4S	29W
Sunset	Transport Oi. Co.		1	4	11N	23W
Santa Fe Springs	Standard Oil Co.	Weisel	9	6	3S	11W
	Tidewater Oil Co.	Dewenter	6	6	3S	11W
	Union Oil Co.	Bell	47	6	3S	11W
	Union Oil Co.	Bell	86 & 92	31	2S	11W
	General Petroleum Corp.	Santa Fe Comm.	178–B	6	3S	11W
Torrance	Packard Petroleum Corp.	Van Alen	1	22	4S	14W
	Silver Beach Oil Co.		1	23	4S	14W
	Wm. A. Kirk		11	23	4S	14W
	E. K. Allison & L. T. Oglesby		1	23	4S	14W
	Pacific Western Oil Co.		2	15	4S	14W
El Segundo	Standard Oil Co.	Refinery	1	13	3S	15W
Coyote Hills	Thomas Kelly & Sons, Inc.	Kelly	11	24	3S	10W
	Standard Oil Co.	Emery	40	13	3S	11W
Long Beach	Chiksan Oil Co., Ltd.	Riedman	1	13	4S	13W
	Chester F. Yunker	Barbara	1	24	4S	13W
	Indiana Drilling Co.	Lyons & Bourdo	1	24	4S	13W
	Union Oil Co.	Long Beach Comm.	22	30	4S	12W
Cat Canyon	Kenneth Marr		4	32	9N	32W
	Kenneth Marr		5	31	9N	32W
Midway	Southern Calif. Gas Co.		1	16	32S	24E
	American Naphtha Oil Corp.	Anoco	1	15	32S	23E
Round Mountain	Shell Oil Co.	Caldwell	8	7	28S	29E
	Shell Oil Co.	Olcese Estate One	1	16	28S	29E
Wilmington	General Petroleum Corp.	Blinn	3	35	4S	13W
	General Petroleum Corp.	Flint Comm.	1	33	4S	13W
Midway	North American Oil Cons.		19	30	31S	24E
Greeley	Standard Oil Co.	Fleishauer Comm. 3	2	20	29S	26E
Mountain View	Mohawk Petroleum Corp.	Hood	8	30	30S	29E
	Mohawk Petroleum Corp.	C. W. Bloemer	2	30	30S	29E
Kern River	Calif. Star Oil Co.		2–80	22	28S	27E
Rio Vista Gas	Tracy Drilling Corp.	Hanson	2	36	4N	2E
ABANDON						
Newhall	Shell Oil Co.	Daugherty	1	9	4N	17W
Santa Fe Springs	General Petroleum Corp.	Santa Fe	168–E	5	3S	11W
Huntington Beach	Doyle Petroleum Corp.		1	10	6S	11W
Los Angeles County	Monte Cristo Petroleum Co.	Ramsey, Bass & Goodknight Garvey	1	27	1S	12W
Ventura	Lloyd Corporation, Ltd.	Lloyd Corp.	1	24	3N	23W
Santa Barbara Co.	Continental Oil Co.	La Laguna	1	24	8N	31W
Sunset	A. B. S. Corp.	Lewis	12	20	11N	23W
Fruitvale	Bilgrad Oil Co.	Bilgrad	1	21	29S	27E
	Crude Oil Producers, Inc.		1	21	29S	27E
Round Mountain	Shell Oil Co.	Caldwell	20	7	28S	29E
Yolo County	Empire Oil & Gas Corp.		1	8	9N	3E
Orange County	Shell Oil Co.	Weisel	1	16	4S	10W
Midway	Barnsdall Oil Co.		9	25	31S	22E
Kern County	Pan-May Oil Co.	Pan-May	1	31	27S	29E
Fruitvale	C. J. Gardner & John R. Powell		1	23	29S	27E
Mt. Poso	George W. Dean	Dean	1	26	26S	28E
	Vedder Petroleum Corp., Ltd.		1 & 2	8	27S	28E

Summary	This Week	Previous Week	To Date This Year	To Date Last Year
Total New Wells	22	20	603	790
Total Deepened or Redrilled	19	17	423	362
Total Abandoned	7	11	239	252

EQUIPPED FOR ANY JOB *and* "RARIN TO GO"!

We like to handle "unusual" jobs because we're unusually well equipped in experience and plant facilities to do high-class work and give satisfaction. If it's done by VERNON—it's done RIGHT! The unusual jobs described below are a few of many recently handled:

Manufactured four giant brass-lined Venturi Tubes for the Colorado River Aqueduct—one is 5 feet in diameter.

Welded the tool joints and couplings on 10,000 feet of drill pipe for a California oil well drilling contractor—a rush job employing 15 welders working 3 shifts.

Machined and assembled 5 hoist drums for gun perforator service.

Rebuilt 3 160 H.P. gas engines, shipped 3 McNeely Mud Screens to Trinidad, British West Indies, and repaired 500 "Rock Gas" container cylinders.

VERNON TOOL CO., LTD.

2740 E. 37th ST., LOS ANGELES, CALIF.

Shell Safety Trophy Awarded at Martinez

Climaxing the first six months of a continuous safety promotion program, high executives of Shell Oil Co. gathered at Martinez Refinery recently to make the first award of the President's Trophy to the Manufacturing Department, which led the entire Shell organization in the work of preventing industrial accidents. The Production Department ranked second and the Marketing Department third in this contest.

At the same time it was announced that Martinez Refinery took first place in the race for the Manufacturing Department trophy, Los Angeles Basin captured the Production Department trophy, and the Hawaiian Division rated best for the Marketing Department trophy.

All trophies will be held six months and then will be awarded again, thus carrying on a continuous competition between different departments and different units within each department, which has raised interest in safety promotion to new heights and created a keen rivalry among thousands of workers.

S. Belither, president of Shell Oil Co., headed the list of executives attending the Martinez ceremony. Others present included G. H. van Senden, vice president in charge of Manufacturing, L. E. David, operations manager under whose supervision the safety work is being carried on, Charles S. Jobe, personnel manager, F. S. Clulow, manager of the Manufacturing Department, A. H. Calderwood, manager of Martinez Refinery, I. M. Hemphill, manager of Wilmington Refinery, and C. J. Nobmann, safety engineer in active charge of safety promotion.

"Twenty-five years ago the oil industry was very dangerous," it was said by Mr. Belither in presenting the trophy to the Manufacturing Department. "It was decided that such a state of affairs could not continue and the industry started work on a large scale to reduce the hazards of employment. In this work, Shell has always been a leader.

"Finance has played its part extremely well in preventing accidents and no expense has been spared to give employees the safest possible conditions under which to work. We employees, on the other hand, have not done so well. Of all accidents today, 80 per cent are due to human carelessness and mistakes and only 20 per cent to mechanical and other causes. We should be careful every day of our lives that we do not take any step in which our carelessness might maim one of our fellow workers."

In accepting the trophy, Mr. van Senden paid high tribute to the men of the department.

"It was your work which won this trophy," he said. "You have made a record that will be hard to maintain but I know you have the spirit to do even better. In 1935, you received a national award for safety work and today's award shows how you have carried on since that time."

Mr. Calderwood, accepting the trophy to be held for three months by Martinez Refinery before it goes to Wilmington Refinery for three months, uttered a note of caution.

"We still have a lot to accomplish in the prevention of simple injuries," he told his fellow workers. "The degree of any injury may be a matter of luck and unless we avoid simple injuries, the chances are that we will have a big one eventually. I hope we will all work hard to prevent those minor happenings which could so easily develop into distress for somebody."

After receiving the President's Trophy from S. Belither, President of Shell, G. H. van Senden (right), Vice President in Charge of Manufacturing, turned it over to A. H. Calderwood (center), Manager of Martinez Refinery, where the trophy will be held three months. I. M. Hemphill (left), Manager of Wilmington Refinery, will retain the trophy for another three months, and it will then be awarded again to the winner in the next contest period.

No special treatment is accorded the petroleum industry in the wages-hours bill passed by Congress on June 14.

California Crude Oil Production

For Two Weeks Ended June 25, 1938

Field	June Daily Quota	Average Daily Production	Excess
San Joaquin Valley			
Belridge—North	15,275	11,846	*3,429
Belridge—South	1,830	1,078	*752
Buena Vista	17,640	17,965	335
Canal	2,255	2,096	*159
Coalinga—East-West	16,080	9,186	*6,894
Coffee Canyon	2,995	3,590	595
Edison	2,580	2,620	40
Elk Hills	8,235	10,549	2,314
Fruitvale	6,975	8,225	1,250
Greeley	3,700	4,757	1,057
Kern Front	8,436	8,060	*376
Kern River	5,330	2,468	*2,862
Kettleman No. Dome	66,165	67,846	1,681
Lost Hills	4,395	3.422	*973
McKittrick	3,445	2,642	*803
Midway	45,475	47,218	1,743
Mount Poso	14,950	16,116	1,166
Mountain View	9,225	11,469	2,244
Rio Bravo	2,265	4,000	1,735
Round Mountain	10,375	10,639	264
Ten Section	6,605	6,511	*94
Other Fields	2,665	2,899	234
TOTAL	256,886	255,202	*1,684
Coastal Counties			
Elwood	5,390	7,126	1,736
Rincon	2,970	4,082	1,112
Santa Maria	8,595	6,838	*1,757
Santa Maria Valley	18,150	7,477	*10,673
Santa Paula-Newhall	5,055	4,978	*77
Ventura Avenue	33,310	34,649	1,339
Other Fields	5,840	5,777	*63
TOTAL	79,310	70,927	*8,383
Los Angeles Basin			
Alamitos-Seal Beach	8,270	8,960	690
Brea-Olinda	8,610	5,707	*2,903
Coyote—East	2,925	3,186	261
Coyote—West	8,440	7,876	*564
Domingues	22,640	26,828	4,188
El Segundo	8,078	9,820	1,742
Huntington Beach—New	14,293	18,353	4,060
Huntington Beach—Old	13,780	14,589	809
Inglewood	14,560	14,443	*117
Long Beach	46,810	58,960	12,150
Montebello	6,793	6,978	185
Montebello:West End	1,812	4,705	2,893
Playa del Rey	5,920	6,535	615
Richfield	8,250	8,688	438
Rosecrans-Athens	4,630	7,960	3,330
Santa Fe Springs	31,430	33,551	2,121
Torrance	8,125	13,199	4,984
Wilmington	65,285	91,024	25,739
Other Fields	2,713	2,908	195
TOTAL	283,454	344,270	60,816
STATE TOTAL	619,650	670,399	50,749

*—Shortage.

Field Development

Los Angeles Basin

Good Wells Spur Torrance Boom

The completion of Lomita Drilling Co. No. 1 with production building up to 900 bbls. a day provided a new stimulus to the already booming Torrance townlot field, boosting the number of working projects to 46. Located near the intersection of Pennsylvania and 233rd St., Lomita's big well started in at the rate of 550 bbls. with the flow gradually increasing to the last reported gauge of 925 bbls., the initial cut of 10% having cleaned up to 3%. The well was finished at 5010 ft. with 6⅝-in. water string at 4880 ft. and a perforated liner landed on bottom.

Another better than average completion was scored by The Texas Co. in Wilson Comm. No. 10 located north of 230th St. and west of Pennsylvania. Bottomed at 5020 ft. and with 137 ft. open, the initial gauged nearly 700 bbls. through a 42/64-in. bean. Present flow is 525 bbls. of 27 gravity clean oil through a ½-in. orifice.

Wilton Oil Co. brought in Well No. 4, its first in the field, with an estimated flow of 380 bbls. cutting less than 2%. This well is located south of 231st St. and west of Pennsylvania. In the same block, which is now the "Hot Spot" of the field, Elexico Oil Corp. finished Allen K-1 at 5015 ft. flowing 550 bbls. of 27.3 gravity oil cutting 0.8%.

At the west end of 230th St., Grubbs & Main obtained 300 bbls. from Lyman No. 1 which was bottomed at 5025 ft. and plugged to 5016 ft.

Northerly wells on the whole, did not fare as well, Charleston Oil Co. and Chanslor-Canfield Midway Oil Co. each completing a well in the 150 bbl. class and Hansco Oil Co. failing to make production, largely due to mechanical troubles. Walter Hughes also was unable to complete his 231st and Narbonne well and is preparing to recondition.

Although the "34" Zone becomes progressively more sandy to the south, forming a better reservoir and making for larger wells, there is practically no dip to the horizon and probably productive limits cannot be calculated. Engineers do, however, agree that there is every reason to believe the new sands will extend farther to the south than the limit of shallow production.

Union Completes Third In New W. Montebello

Union Oil Co. completed its third well in the new west Montebello area recently with an initial flow of 800 bbls. cutting 65% salt water. Located on the Howard & Smith lease south of Lincoln Ave. and west of Montebello Blvd., it was bottomed at 5770 ft. in the Fifth zone, which in this portion of the field contains a water horizon. After the open flow test, a 40/64-in. bean was installed reducing the flow to 335 bbls. of 34 gravity oil cutting 60%. Gas production is 600,000 cu. ft.

That the Fifth zone may be too wet to be productive west of Maple and south of Lincoln is indicated by the Herley-Kelley Burke No. 1 which is now coring for the sixth zone. A formation test was said to have been made in the upper Fifth which recovered mostly water.

Brookline Oil Co., Drake Comm. No. 1, most southerly well on Maple Ave., is preparing to complete in the Sixth Zone from 6444 ft. after cementing 8⅝-in. casing at 6360 ft.

Long Beach Extension Is Pushed Northwest

Cornelius G. Willis added another plume to the already large collection in his cap by giving himself and associates in the Hilldon Oil Co. a Fourth of July present of a 750-bbl. well on the Dominguez lease. The well, known as No. 1-8, is the most northwesterly in the Long Beach extension area and was drilled jointly by the Caminol Co. and Hilldon. Bottomed at 7786 ft. in sands

LOS ANGELES BASIN WILDCATS

Area	Well	No.	Section	Depth	Status
Los Angeles County					
Bellflower	Clayton, Geo. L., Scott	1	32, 3-12	6897	Idle
Brea	Pressel, Perry, Tull	1	30, 2-9	4560	Idle
Castaic	Royal Land Corp.	1	8, 4-17	850	Drilling
La Mirada	John McKeon & Assoc. Carmenita	1	21, 3-11	5355	Drilling
Monterey Park	Monte Cristo, Garvey	1	27, 1-2	5412	Abandoned
Newhall	Barnsdall Oil Co., R.S.F.	3	26, 4-17	6990	Drilling
	National Pet. Corp.	1	27, 4-16	2475	Idle
	Palmluck Oil Co.	1	23, 3-16		Rigging up
Palmdale	Antelope Valley Pet.	1	17, 6-12	50	Idle
Palos Verdes	Gene McLaren	1	27, 4-14	3992	Idle
	Rolling Hills Pet.	1	27, 4-14	4220	Cleaning out
Pico	British Am. O. P. Co.	1	12, 3-12	4568	Idle
San Fernando	Tidewater Assoc., Porter	1	27, 3-16	1150	Drilling
Whittier	Langstaff, Geo. W., Iliff	1	8, 2-11	1320	Drilling
San Bernardino					
Chino	So. Counties Pet. & Drlg. Co.	1	26, 2-8	375	Drilling
Orange County					
Costa Mesa	A. V. Oil & Gas Co.	1	16, 6-10	3560	Drilling
Kraemer	Congress Oil Co., Kraemer	1	36, 3-9	3017	Testing

similar to the Alamitos zone in the oil field, Domingues No. 1-8 opens a new page in the intensely interesting history of the Long Beach field.

Open to production between the shoe of the 7-in. casing at 7737 ft. and bottom, the well was swabbed several days but failed to develop enough "kick" to flow although the fluid was clean 24 gravity oil. As several good looking intervals were known to be behind the pipe, it was decided to perforate opposite the lowest before continuing with the production test. After "shooting" between 7705 and 7730 ft., the well started flowing through the 7-in. casing before tubing could be run. Using a 56/64-in. bean, gas flow was 1,700,000 and casing head pressure was 225 lbs.

In the Bixby Road sector of the extension area, Hilldon Oil Co. finished Amebco No. 4 at 4494 ft. flowing 75 bbls. of oil and 2,500,000 cu. ft. of gas. The water string was 8⅝-in. set at 4385 ft.

DeSoto Oil Co. is preparing to set 13⅜-in. casing at approximately 4250 ft. in its deep test of the Lovelady area. A cooperative enterprise of several independent operators, the well is intended to answer the important question of deeper production at Signal Hill.

Indicating that the older part of the field is still capable of nice wells, The Texas Co. brought in Wilson Fee No. 1 half a block from the discovery well pumping 197 bbls. cutting 5%. The well was bottomed at 4680 ft. in the Brown zone after drilling in with oil under pressure.

30 Strings Run In Wilmington

Second only to Torrance in point of activity, Wilmington is yet the most important field in California from several aspects. The more than thirty strings of tools now working are all employed on new wells, no old wells being deepened at present, a factor to the interests of supply houses. In point of production, the field leads its nearest rival, Kettleman Hills, by more than 20,000 bbls. daily and in so doing exceeds its quota by 26,000 bbls., 55% of the state's average of 45,000 bbls. a day curtailment to the present level of 91,000 bbls. a day is in itself a notable achievement. But should in no way lessen efforts to further reduce production. Most development work now underway is by major operators, promoters in recent weeks having turned to more spectacular fields.

One of the largest royalties on record will be received by the City of Long Beach from approximately four acres lying beneath the turning basin in the harbor area. The D. D. Dunlap Oil Co. will pay 62.5% royalty on the oil and all of the dry gas for the privilege of drilling three wells from surface sites obtained from the Union Pacific Railroad. O'Kane & Brain were the successful bidders on city lands at Ocean Blvd. and Pico where only Ranger zone production is expected. Two wells have been started on the latter parcel. Bids are now being received by the Harbor Commissioners on city property located at Broadway and Pico and on the gas holder site south of Anaheim and west of Santa Fe Ave. Only the Ranger will be productive on these properties also.

Significant of future development in the northeast section, Richfield Oil Corp. completed Victory No. 1 at Anaheim and Hayes Sts. pumping 150 bbls. of clean 16.0 gravity oil from 3455 ft. Drilling costs being relatively low, other operators are expected to enter this portion of the field.

At the corner of Denni and Avalon, Macson Oil Co. bottomed G-55-1 at 3670 ft. and completed at the initial rate of 350 bbls. a day, clean. The company is finishing O-55-1 and drilling O-55-2 in the same area.

Three Terminal zone wells were completed by Union Pacific, none for large yields, while Richfield Oil Corp. was finishing two in the same horizons.

Wilmington Oil & Development Co. deepened W-1 to the Ford zone and completed at 5700 ft. flowing 250 bbls. of 28 gravity oil.

The annual Metal Mining Convention and Exposition of the Western Division of the American Mining Congress will be held at the Ambassador Hotel, Los Angeles, October 24 to 27.

Voting to table the resolution calling the bill amending the Walsh-Healey Government Contracts act up for floor consideration, the House Rules Committee killed any chance for consideration at this session of Congress.

37,000,000 passenger cars in this country by 1960 is the prediction of Charles F. Kettering on which the auto industry has focused its attention. . .

Federal gasoline tax receipts stood at $16,436,554 in April, an increase of nearly 11 per cent over April 1937, when $13,591,593 was collected.

New passenger car registrations for 14 states in May totaled 32,988, a decrease of 9.85 per cent from the 36,591 of April, according to figures recently released.

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San Joaquin Valley

Gatchell No. 2 Is 20,000-Bbl. Producer

Completion of Petroleum Securities Co.'s exploratory well, Gatchell No. 2, on Anticline Ridge has definitely proved the existence of another new and great San Joaquin valley field. The initial flow of 20,000 bbls. through casing and tubing has been beaned back with a 12/64 orifice to a conservative 700 bbl. rate, the oil being 33 gravity and free of water. A satisfactory gas-oil ratio is maintained by the well, the gas measuring 312,000 cu. ft. under a flow pressure of 1265 lbs. and a casing head pressure of 1540 lbs.

Unlike other new valley discoveries, geophysics played no part in the locating of this test which was based entirely on a thorough study of the general geology of the area. Only a year ago was the Avenal member of the Eocene found to be productive at Kettleman North Dome and in the intervening time only a few wells have obtained production from it. However, a well defined saddle was known to be present between Kettleman Hills and the Guijarral Hills, where formations began to rise toward the northwest at the rate of about 16 ft. vertically per hundred latterly. With the Coalinga anticline plunging southeasterly through the Guijarral Hills, and forming a perfect closure in that direction, it only remained to find a seal to the northwest. No direct evidence of such a seal could be found, but sceveral possibilities presented themselves. An unconformity might exist between the Kreyenhagen and the Avenal or between the Avenal and the Cretaceous, which would "pinch out" the Eocene sands at the contact of the two shales. Again, a fault, not reflected in the overlaying sediments, might form the barrier for an accumulation. In any case, there was every reason to believe the Avenal sand would be present in the location for the test well, and though no oil had been produced from this sand in shallow wells drilled at the northwest end of the East Coalinga field, it was known to overlay an excellent potential source rock.

At the start, the well was considered to have three possible productive horizons; the Temblor, which was found to be barren; the Vaqueros, which was entirely absent, and the Avenal. In the last horizon, topped at 6710 ft., the first sand zone of 30 ft. was fine grained and gray in color, but gave a fair reaction to acetone, to all appearances a gas sand. This later, on formation test, proved unproductive. Cores from 6740 to 6815 ft. were hard siltstone, below which the drill dropped into a comparatively soft body of very coarse, sharp, friable sand, well saturated with oil, which continued to bottom at 6908 ft. Because of its abrasive quality, much difficulty was experienced in making hole through this sand, as in going in for a core, the bit was dulled before the cavings could be cleaned out to bottom. Due to this, the well was not carried to its intended depth of 6925 ft.. Before deeping below the bottom of 6849 ft., where the well stood idle for two months, a formation tester was set at 6790 ft. and a flow estimated at over 3000 bbls. a day rate was obtained. After 45 minutes it sanded up and died. When the tester was pulled, the bottom hole bean was found to be badly sand cut and would have been completely cut out had the test lasted 24 hours. After carefully reaming to bottom, a perforated drillable liner was landed and the well brought in with a few runs of the swab.

With only one well completed at present, it is impossible to predict the ultimate limits of the field. Neither the type nor the position of the barrier forming the northwest closure are yet known, and, in the opinion of some, production may extend to the south and east as far as Kettleman Hills. A discussion of the general geology of this area was presented by Dr. Gerard Henny in the May 20, 1938, issue of the California Oil World.

Eight new projects have been started on the strength of the new discovery. The Texas Co. is preparing to drill Mohawk No. 19 in the northwest quarter of sec. 12, 20-15, Universal Consolidated Oil

SAN JOAQUIN VALLEY WILDCATS

Area	Well	No.	Section	Depth	Status
	Fresno County				
Coalinga	Magnet Oil Co., Fearon	2	18, 20-15	2800	Drilling
	Petroleum Sec., Gatchell	2	18, 20-16	6849	Flowing
	Univ. Cons. Oil Co., L. H.	1	12, 20-15		Rigging up
E. Coalinga	Pure Oil Co., SPL	1	31, 18-17	10861	Redrilling
Clovis	Central Valley Oil Co.	1	1, 12-20	588	Idle
Jacalitos Hills	Jacalitos Pet. Co.	1	14, 21-15	5745	Cleaning out
	Dauphin Dev., Boone	1	30, 21-14	3780	Testing
		2	30, 21-14		Grade
Panoche Hills	Panoche Hills Oil Co.	3	12, 14-11	300	Idle
	Kern County				
Arvin	Petrex, Inc.	1	32, 31-30	5240	Drilling
	Union Oil Co., Berry	1	15, 31-29	6812	Testing
Belridge	Abbott, F. E.	1	18, 27-19		Rig
	General Pet., St. Helens	1	12, 28-20	8683	Testing shallow zone
	Shell Oil Co., Voight	4-1	32, 27-20		Rig
Buena Vista	Ohio Oil Co., KCL	A-8	32, 31-26	11186	Testing
Devils Den	Amerada Pet. Co., Beer	5	22, 16-19	8295	Redrilling
	Gibson Oil Co., Alferitz	3	14, 25-18	520	Testing
	Goodrum, Geo., Baron	1	24, 25-18	1210	Idle
Dominion	Dean, Geo. W.	1	26, 26-28	1177	Abandoned
Edison	Stevens, Ray	1	22, 30-30	760	Drilling
Elk Hills	Richfield Oil Corp. KCL-W	1			Location
Fruitvale	The Texas Co., C.W.L.	1	7, 29-27	6395	Drilling
	Continental Oil Co.	B-2	12, 29-26		Rigging up
Grapevine	Petrol Corp., Reserve	5	33, 11-19	4607	Drilling
	Richfield Oil Corp. KCL-1		28, 11-20	4465	Drilling
Lerdo	Standard Oil Co. KCL 18-1		29, 28-26	9510	Drilling
McFarland	Tidewater Assoc. Oil Co.,Pond	1	17, 26-25	6773	Drilling
	Shell Oil Co., KCL	83-35	35, 26-25	8808	Drilling
Poso Creek	Reynolds Oil Co.	1	20, 27-27	2855	Idle
	Harkness & Laws, Hunt	1	28, 27-27		Foundation
Richgrove	Dilamar Oil Corp., Quinn	1	15, 25-27	2956	Testing
		3	15, 25-27		Rig
San Emigdio	Shell Oil Co. KCL 4-26		26, 11-22	9825	Redrilling
Strand	Continental Oil Co.	E-1	17, 30-26	8575	Testing
Temblor Hills	Chico Martinez Oil Co., Holly	1	1, 29-20	1108	Testing
	Kings County				
Dudley Ridge	Falcon Oil & Gas Co. No.	1	24, 23-20	6500	Idle
Pyramid Hills	Pyramid Prod. Co., Retherford	1	27, 24-18	3090	Idle
Kettleman	Temblor Oil Co., Bunting	1	25, 23-18	9138	Plug 7815—Idle
	Tulare County				
Alpaugh	Sullivan & Youngdahl	1	33, 23-23	2732	Idle
Ducor	Nelson & Davison	1	1, 24-27	375	Idle
Trico	Caminol Co., A. O. G.	3	29, 24-24	7555	Prep. to deepen

Co. is rigging up Leavitt-Hintze No. 1 in the same section and Superior Oil Co. has started Hight No. 1 in sec. 8, 20-16. Petroleum Securities' next well will be Grimes No. 88 in the southeast corner of sec. 12, 20-15.

Two miles and a half northwest of the discovery well, Medford Oil Co. has erected a derrick in the northeast corner of sec. 10, 20-15.

The heavy lines on the map on page 7 outline the area to be included in the proposed well spacing program and should not be taken to indicate possible field limits.

In part stimulated by Gatchell No. 1, Magnet Oil Co. has spudded Fearon No. 2 in sec. 18, 20-15, six miles due west. Considered a wildcat by the operators, no information is released but the depth is believed to be approximately 2800 ft.

Resume Operations In Jacalitos Hills Wildcat

The Jacalitos Petroleum Co., whose wildcat well in the Jacalitos Hills has been standing idle for several months, is now resuming operations with the intention of carrying the hole deep enough to test the Avenal sand, now producing at Coalinga as well as Kettleman Hills. located in sec. 14,21-15, the well was originally drilled to 5473 ft., encountering the top of the Kreyenhagen at 5570 ft., but due to drift, the hole was plugged and redrilled to 5680 ft., the present bottom. An 8⅝-in. protective string has been cemented at 5445 ft. preliminary to deepening.

Coal Oil Point Wildcat Features Santa Barbara

Most interesting of the present crop of Santa Barbara county wildcats is that of South Crude Oil Co. in the old Bolsa Chica permit No. 191 at Coal Oil Point. The No. 2 hole was entered by the new operators who are now redrilling below 4200 ft. seeking production in the Vaqueros sands. Should oil not be found in that horizon, the well may be taken into the Sespe formation.

After failing to find either the Vaqueros or the Sespe productive in Hollister No. 1, sec. 35, 5-33, Wilshire Oil Co. is preparing to abandon the test at 4600 ft. The adjoining Gaviota Oil Co. well is pumping salt water with a small amount of oil from the new depth of 3215 ft., the formerly large gas volume having disappeared.

J. E. O'Donnell has suspended operations on his Helen No. 1 at 3580 ft. The well is located in sec. 8, 7-33, southeast of the Lompoc field.

Bardsdall Oil Co. has two active projects in the Gato Ridge field, both located in sec. 9, 8-32. Tognazini No. 3 is nearing completion below 3165 ft. and derrick is finished for Magenheimer No. 5.

Carpinteria Oil Co., operating within the townsite of Carpinteria, has again resumed work and was last reported at 2425 ft. in hard brown shale.

Deep Buena Vista Test Encounters Two Oil Pays

Preparatory to testing oil sands cored near bottom at 11,186 ft., Ohio Oil Co. has set 7-in. casing at 11,147 ft. in KCL A-8, deep test of the Buena Vista gas field. This is the second oil horizon uncovered in this well, the first being the Stevens sand equivalent between 10,020 and 10,140 ft. which appeared to be productive but was not tested. It is probable that the forthcoming production tests will establish this area as one of the major valley floor fields.

Shell Continues Test In Belridge District

Shell Oil Co. is continuing with its exploration work in the Belridge area with a new well, Voight No. 4-1, located in 32,27-20 and adjoining its recently abandoned Voight No. 1-1 which was carried to 4100 ft.

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Dauphin Is Testing Waltham Valley Cat

Dauphin Development Co. has been making a series of tests in its Waltham Valley wildcat. Boon No. 1 in sec. 30, 21-14. Redrilled to 2536 ft. after the original 3780-ft. hole was found to be crooked, a perforated liner was landed and a swabbing test made, which proved wet. The liner was then pulled and the hole plugged to 2330 ft., where more swabbing failed to develop production. Further tests are planned for No. 1 and another well will be drilled in sec. 19.

Mountain View Well Nets Hogan 3024 Bbls.

Hogan Petroleum Co. recently finished the only active drilling project in the Mountain View field with the unusually large flow of 3024 bbls. a day. Located near the southwest corner of sec. 29, 30-29, Porter-Day No. 11 was carried to 5080 ft. where it was completed with 70 ft. open to bottom. With a 53/64-in. bean, present production is 2400 bbls. of 28.8 gravity clean oil.

Two Wells Active In San Luis County

Fred Roberts has acquired the old Scott Petroleum Co. well in the Edna field of San Luis Obispo county and has cleaned out the 4600 ft. hole to 3250 ft. to test for production.

Hancock Oil Co. is finding the going very hard below 4200 ft. in Sherer-Dickes No. 1. The well is located in the Huasna area where several previous tests have encountered good showings in the brown shale, but none have obtained commercial production.

Petrex Alone Active In Arvin District

Activity is now at a low ebb in the Arvin area, with Petrex the only operator now working. Petrex, Inc. No. 1, sec. 32, 31-30, is reported drilling in granitics at 5240 ft. after cementing an 8 5/8-in. protection string at 1400 ft.

Between Arvin and Mountain View, Union Oil Co., Berry No. 1 is pumping about 20 bbls. a day of 22 gravity oil cutting 30% from the redrilled depth of 6135 ft.

Bulk petroleum shipments from Los Angeles harbor during the week ending June 4 totaled 1,568,731 barrels, almost 200,000 barrels greater than the total for the previous week, it was reported by the Chamber of Commerce Marine Exchange.

POLAR CORE ORIENTATION

(U. S. Patents 1,778,981; 1,792,639; 2,089,216; 2,104,752; 2,105,650 and others pending)

GENERAL

The orientation of a core to determine its direction of dip is performed in our Laboratory, to which selected core samples, taken by any type core barrel in the ordinary course of drilling, are shipped from any distance. No special equipment is required at the well, nor is the program of drilling impeded.

The cores received at our Laboratory are first ground into true cylinders and afterwards tested in our automatically operated orientation apparatus, which photographically records the polarity of the core, from which the magnetic North-South axis is located. The results of this method are accurate and reliable. The value of knowing the direction of dip in wildcat wells, or in unexplored deeper zones or defining structures in proven fields is well known.

SELECTION and PREPARATION

To obtain the best results the following procedure in the selection and preparation of the core samples is recommended:

1. Type and Size of Samples—Samples with **visible indications of a bedding plane** should be taken from the core barrel by the geologist as soon as the core barrel is returned to the surface and should be marked at that time indicating "Top" and "Bottom".

Core samples of soft formation, or those which easily disintegrate, should be carefully washed of all drilling mud and all other foreign substances. The clean core should then be dipped in Sherwin-Williams clear lacquer of vegetable compound and then wrapped tightly in "Kodapak" with the ends also protected.

Materials which contain heavy mineral grains, distributed throughout, such as sandstones, sandy shales or shales streaked with sand are the most suitable. Pure limestone, dolomite or anhydrite are not workable.

Cores without visible stratification other than breaks along the bedding planes can be used if notation indicating these breaks represent the true bedding is made by the geologist on the envelope containing the core sample.

The samples received should not be less than two (2) inches in diameter and the lengths between perpendicular ends should not be less than three (3) inches. Samples of smaller size, if smooth and unbroken, will be tested at customer's risk.

2. Number and Depth Range—One set of cores or samples shall comprise not less than three (3) and not more than five (5) individual cores or samples taken within a depth range of **not more than one hundred feet (100') in one bore hole.**

3. Precautions in Handling—Cores prepared for orientation should be carefully packed so as to avoid breakage in transit. They should never be left in the vicinity of any direct or alternating current field, or near any magnetic field.

4. Data Required—Samples should be accompanied by a letter giving the following information:

a. Identification of set of samples by well, name, and number and its approximate location by Field, County and State. If desired the well can be identified by a code number.
b. Type of material of samples.
c. Geological horizon of samples.
d. Depth from which each sample was taken.
e. Inclination and direction of the hole at depth at which samples were taken. **This is extremely important** when submitting samples with very low angle bedding planes.
f. Magnetic declination of locality where samples were taken.

METHOD OF SERVICE

Forward samples and information to our Laboratory at 549 East Bixby Road, Long Beach, California, carefully packed to avoid breakage. A comprehensive report on the findings will be dispatched within three days of receipt, or earlier if possible.
The service is strictly confidential.

SERVICE CHARGES

Service charges depend upon the results obtained and are as follows:

a. Determining the orientation from a set of three (3) to five (5) samples.....$150.00
b. Service charge for running three (3) to five (5) samples through apparatus when samples fail to show polarization.....$100.00
c. Service charge for three (3) to five (5) samples which after grinding fail to show bedding planes .....$ 50.00

Remittance covering charge for orientation must accompany core samples shipped from foreign countries.

CONDITIONS

Tests are made at the customer's risk and the company does not assume any liability from any cause whatsoever.

TRANSPORTATION CHARGES

Transportation charges shall be borne by customer. If core samples are called for at customer's location at his request, a charge of ten cents (10c) per mile will be made for the round trip.

TERMS OF PAYMENT

All charges are net. Invoices will be rendered upon completion of tests.

A discount of One Percent (1%) will be allowed if invoices are paid within ten (10) days after they are rendered. Invoices should be paid within thirty (30) days after being rendered; if not paid within this period, interest at six percent (6%) will be charged.

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N. W. Fruitvale Test Promises Greeley

The northwest Fruitvale test of The Texas Co., Camp-West-Lowe No. 1, located in sec. 7, 29-27, is rapidly becoming one of the most interesting exploratory wells in the San Joaquin valley. At 6380 ft., far above the point where production is expected, several good oil and gas showings have been noted on the ditch, and the possibility of finding the Greeley zone productive is now considered better than ever.

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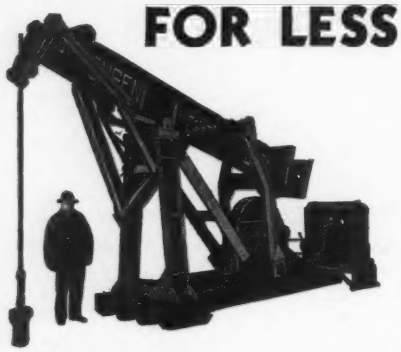

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A mile to the west in sec. 12, 29-26, Continental Oil Co. is spudding KCL No. B-2.

Completing two new wells in the past two weeks, Superior Oil Co. boosted its total number of Rio Bravo producers to seven while, since the field's discovery last November, no other operator has completed more than one.

Latest Superior wells are Anderson No. 1 and Wagner No. 4, both located in sec. 35, 28-25, but on opposite flanks of the apparent structural axis. Anderson No. 1, located north and east of the center of the west half of the section, topped the oil sand at 11,385 ft. and bottomed at 11,608 ft. after penetrating 10 ft. of gray sand. Originally swabbed in barefoot, common practice in this field, the well flowed at the rate of 6100 bbls. a day but sanded up within a few hours. After being cleaned out, a perforated liner containing one blank section on bottom was landed, and the well recompleted gauging 1000 bbls. of 35.5 gravity oil.

Wagner No. 4, which is located in the southwest corner of the section, found the top of the zone at 11,370 ft. and finished drilling at 11,555 ft. Fearing a repetition of the sand trouble encountered in the Anderson well, the company ran a liner before swabbing. Initial production was 1480 bbls. a day of 38 gravity oil and 1,000,000 cu. ft. of gas through a 12/64 in. bean with pressure of 1775 lbs. on the tubing and 1850 lbs. on the casing.

Geisinger No. 2 cored the Rio Bravo at 11,330 ft. and is preparing to complete after setting casing at 11,323 ft.

Superior continues to startle the world with unbelievable drilling records in this field Wagner No. 4 having drilled 11,555 ft. of hole, set 2498 ft. of 13⅜-in. casing. 11,363 ft. of 7⅝-in. casing and landed 231 ft. of perforated liner in exactly 60 days.

Next two Superior wells to be finished will be Helbling No. 1 in sec. 1, 29-25 and Geisinger No. 3, sec. 35, 28-25.

After milling on collapsed casing at 6100 ft. for several weeks, Union Oil Co. has succeeded in getting away from fro mthe old hole in the ill-fated Kernco No. 34-2 and is sidetracking below 7000 ft.

Kernco No. 34-3, barring mishaps, will be Union's next and second completion in the field. A string of casing has been cemented on bottom at 11,206 ft., preparatory to drilling into the oil sand. No. 34-4 is drilling below 7350 ft. and No. 34-5 is yet only a foundation.

General Petroleum Corp. has two strings of tools running, Wagner No. 3 redrilling at 10,000 ft., and Wagner No. 4 drilling below 2000 ft.

Valley Floor Tests Prove Disappointing

Although several major company valley floor wildcats are now drilling at crucial depths, results have been far from spectacular.

General Petroleum Corp. is considering abandoning St. Helens No. 1 which failed to find deep production south of North Belridge and is now pumping 10 bbls. a day from 1400 ft.

Because of the high level of Buena Vista Lake, Richfield Oil Co. has found it necessary to build a bridge to the location selected for KCL-Western No. 1 in sec. 32, 30-25. Actual drilling will not be underway for at least 30 days.

Standard Oil Co.'s interesting Lerdo wildcat, KCL 18-1, sec. 29, 28-26, was last reported as coring barren silty sand below 9450 ft.

Disappointing to the Shell Oil Co. was the finding of the Rio Bravo zone barren in KCL No. 83, in sec. 35, 26-25 near McFarland. The sand, topped near 8700 ft., was devoid of both oil and gas and the hole is now being deepened in hopes of finding a lower productive formation. Pond No. 1, Tide Water Associated Oil Co. test of sec. 17, 26-25, has found nothing of importance to present depth of 6920 ft.

Heaving shale has again brought disaster to Shell's San Emigdio well, KCL 1-A4 in sec. 26, 11-22. After setting protective casing at 9311 ft. in the redrilled hole, a caving below the shoe has again frozen the drill pipe.

After exploring ahead to 8575 ft., Continental Oil Co. plugged its Strand area wildcat, KCL E-1, to the 8200 ft. horizon where another series of tests will be made. The well is located in sec. 17, 30-26 north of Ten Sections and east of Canal.

Only two operators are active in the sensational Wasco field, Standard Oil Co. and Continental Oil Co. each with two wells. Standard's Mushrush No. 1 is now below 5500 ft. while KCL 8B-1 has passed 7750. Continental's Seaboard-Associated KCL No. C-1 is drilling below 12,279 ft. and should pick up the Rio Bravo within the next 500 ft. KCL A-3-8 is nearly 9000 ft. in depth.

On appeals by both the oil companies and the government, the fight over Mexico's expropriated oil properties was taken to the Supreme Court on June 15.

Geo. F. Getty, Inc. Ramsey No. B-2 is approaching 10,000 ft. in depth.

Coastal District

Six Strings Running In Santa Maria Field

Santa Maria valley activity is at the lowest point in more than a year, with only half a dozen strings of tools now running. From all appearances completions will continue to outnumber new locations for the next two or three weeks, after which development should maintain a steady rate based on minimum lease requirements throughout the field.

No sensationally large wells have been placed on production of late, the 400-bbl. I. J. Banducci in sec. 26, 10-34 taking top honors. Selegna Drilling and Producing Co., S. M. No. 1, in the same section, was finished at 5250 ft. with an initial of only 250 bbs .

Union Oil Co. Wheat No. 2, finished at 3945 in sec. 22, pumped only water on first test, and is undergoing remedial work. The company's Nicolai No. 1 in sec. 28 penetrated 17 ft. of schist to 5195 ft. and completed flowing 395 bbls. cutting 20%.

The combined operators, R. R. Bush Oil Co. and Hancock Oil Co., have spudded California Sands No. 3 after finishing Hopkins No. 4 at 4278 ft.

Hobson B-21 Rincon Above Average Producer

Chanslor-Canfield Midway Oil Co., recently completed Hobson B-21 at Rincon as one of the field's better producers. Bottomed at 4536 ft. and with 9-in. casing set at 4455 ft., 144 ft. of 5¾-in. liner including 80 ft. perforated was landed and the well brought in flowing 28.8 gravity oil at the rate of nearly 500 bbls. per day. When last reported, the 10% cut appeared to be cleaning up. Derricks have been built for numbers B-18 and C-7.

Richfield Oil Corp. has overcome its difficulty in Hobson State No. Fee 1 and is now making new hole in the right direction below 3150 ft.

Ridge Oil Co., a new company headed by Robert A. (Bob) Berkey, has chosen a location for its first well on the Fox property in sec. 9, 3-24.

San Miguelito Activity Reaches New High Level

With three wells drilling or preparing to drill, San Miguelito is now at the height of one of its more active periods. C. C. M. O. Co. has twice as many projects under way as its rival, Continental Oil Co., which is preparing to spud Grubb No. 9, while the former company is drilling Oakgrove No. 7 below 2200 ft. and has the rig up for Hobson No. A-6.

Ventura Avenue Center of Santa Maria Activity

Since the near shut-down at Santa Maria, Ventura Avenue, with a dozen strings of tools running, is again the most active field in the coastal district. Controlled entirely by major companies, development work is carried on steadily from year to year. Tide Water Associated Oil Co. remains the most extensive operator with eight projects, Shell Oil Co. having three and General Petroleum Corp. and Lloyd Corp. one each. The latter company is preparing to drill its second east end well after the first failed in finding production to 7500 ft.

Coring Oil Formation In Carreaga Wildcat

Douglas-Stratton Oil Co. is coring hard fractured brown shale showing considerable oil in its Carreaga well located in sec. 8,8-33, two miles south of the old Santa Maria field. Now below 6000 ft. in depth, cores in the last 100 ft. have shown increasing quantities of oil and all indications point to a better possible production than that of the Arnold-Apache well nearby, which was completed last fall pumping 75 bbls. of 26 gravity wet oil from 6370 ft. The Productive formation is the Monterey shale, topped in this well at 5000 ft.

NORTHERN COUNTIES WILDCATS

Area	Well	No.	Section	Depth	Status
Colusa	Amerada Pet. Co.,Calif. Lands	1	34, 16-1	3803	Drilling
Glenn	Ohio Oil Co., Willard	2	18, 20-2	5688	Drilling
Humboldt	The Texas Co., Eureka	2	22, 3-1	7708	Plug 6473-Shut in
Monterey	The Texas Co., Lewis	1	13, 19-5	525	Drilling
San Mateo	Wilshire Oil Co., Cowell	1	20, 6-5	8007	Idle
Solano	Richfield Oil Corp., Potrero	1	10, 4-1	3355	Testing
	The Texas Co., Midland	1	4, 3-3	4030	Testing

COASTAL COUNTIES WILDCATS

Santa Barbara County

Area	Well	No.	Section	Depth	Status
Carpinteria	Carpinteria Oil Co.	1	32, 4-5	2430	Drilling
Carreaga	Douglass-Stratton Oil Co.	1	8, 8-33	6025	Drilling
Cat Canyon	Standard Oil Co., Los Flores	1	27, 9-33	5530	Redrilling
Coal Oil Pt.	South Crude Oil Co.	191–2	24, 4-29	5510	Redrilling at 4200
Gaviota	Gaviota Oil Co., Hollister	1	35, 5-33	3215	Testing
	Wilshire Oil Co., Hollister	1	35, 5-33	4600	Drilling
Gato Ridge	Barnsdall Oil Co., Tog.	3	9, 8-32	3430	Drilling
Los Olivos	United Western, Bradley	1	15, 7-30	3279	Idle
Lompoc	O'Donnell, J. E. Helen	1	8, 7-33	3580	Drilling
Orcutt	Warren Deuel, Garrett	1	12, 9-34		Rig
Refugio	Tweedy, A. E., Penn.	1	34, 5-31	1700	Idle
Summerland	Gauthier Oil Co.	17–1	22, 4-26	1400	Idle

San Luis Obispo County

Edna	Loma Grande Oil Co., Lewis	1	28, 31-13		Rig
Elk Horn	Calif. Pet. Prod. Co.	1	6, 10-24	1960	Drilling
	Western Plains Oil Co.	1	7, 31-21	4010	Idle
Huasna	Hancock O. Co.,Sherer-Dickes	1	30, 12-33	4250	Drilling
Paso Robles	Ajax Land & Dev. Co., Moss	1	27, 26-13	475	Idle
	Vanguard Oil Co.	1	14, 27-14	4360	Idle

Ventura County

Moorpark	Darby Oil Co., Cohn	1	7, 2-19	3250	Drilling
Oxnard	Walter G. Rowe, Johnson	1	15, 1-22	4705	Idle
Ojai	High Mesa Oil Co.	1	16, 4-22	1700	Drilling
	Holly Dev. Co., Macrate	1	27, 4-23	1550	Drilling
Red Mountain	Martin, J. W.	3	15, 4-21	1500	Drilling
Sespe	Commander Oil Co.,Temescal	7-F	13, 4-18	215	Idle
	Condor Oil Co.	1	6, 4-19	2195	Pumping
	Garmack Oil Co.	1	28, 5-19	565	Idle
	McKinnis, Chas., Crosby	1	14, 4-19	150	Drilling
	La Salle & Van Dissen	1	15, 5-19		Grade
	Merchants Pet., Cochran	8	1, 4-20	685	Drilling
	Speik Oil Co.	1	33, 5-19	3440	Idle
	St. Louis Oil Co.	1	1, 4-20	420	Cleaning out
	Terry, Geo., et al	1	23, 5-20	1340	Idle
South Mt.	The Texas Co., Richardson	5	13, 2-21	5965	Drilling
	Clipper Oil Co.	1	17, 3-20		Rig
Tar Creek	Section 20 Oil Co.	1	20, 5-19	1611	Drilling
Timber Canyon	Stallings, Senter, Ahlberg	1	24, 4-21	1025	Drilling

Very little is left to the geologist's imagination by this exposure of the San Miguelito Anticline in Ventura county. Chanslor-Canfield Midway and Continental Oil companies are now active in the field.

Holly Spuds Wildcat Near Ojai, Sec. 27, 4-23

Holly Development Co. has spudded its interesting wildcat, Macrate No. 1, in sec. 27, 4-23 near Ojai ,and is passing up shallow showings to test the Vaqueros sands which are expected above 3000 ft. Also backing the well are Seaboard Oil Co. and Holly Oil Co.

Moorpark Test Below 3250 In Ventura Co. Sespe Play

Darby Oil Co., testing the Cohn property in sec. 7, 2-19, near Moorpark in Ventura county, found the going easy to the top of the Sespe formation which was encountered at 1930 ft. Though slowed by the red beds, good time is being made and when last reported, bottom was below 3250 ft.

Shell Resumes Activity In El Capitan Field

Shell Oil Co., after a period of inactivity in the El Capitan field, has launched a new three well development program. The wells, all on the Covarrubias lease, will be offsets to producers recently brought in by General Petroleum Corp. on the Erbury property.

No action is planned for this session of Congress on the Bill (H. R. 10854) to increase import duty on petroleum products, introduced by Mr. Houston of Kansas.

Signed by the President on June 8, the Federal-Aid Highway Act of 1938 (H. R. 10140) authorizes Federal-aid to the states amounting to $158,500,000 for the fiscal year 1940 and $191,000,000 for the fiscal year 1941.

Cooper-Bessemer Compressor

Interest in Cooper-Bessemer's new Type G-MV Compressor Unit was evidenced by the throngs that visited that company's exhibit space during the recent Petroleum Exposition at Tulsa. Displaying a Semi-Diesel pumping engine, a new 40-50 horsepower vertical compressor, a small compressor for furnishing starting air, and a four-cylinder unit of this new Type G-MV Compressor, the Cooper-Bessemer building was a busy place every day of the week and the last named unit garnered a large share of the visitor's attentions.

A two-cycle, gas-engine-driven compressor combining V-type power cylinders set vertically, and compressor cylinders arranged horizontally, this addition to the company's line of engines and compressors is rated 100 horsepower per cylinder at a conservative speed of 300 r.p.m. It is said to be a thoroughly engineered answer to the oil and gas industries' constant requests for greater horsepower in smaller compressor units. Extreme compactness serves to make the G-MV Compressor readily transportable, reduces the amount of floor space and materials necessary for its housing, lowers foundation material expense, and makes for welcome ease of installation. Shipped completely assembled, except for attaching the compressor cylinders, its factory alignments need not be disturbed and the unit is quickly and easily made ready for operation.

Designed primarily for compressor operations which include compressing air and gas, pumping wells by air and gas lift, delivering oil and gas to main lines and transporting them through long pipe lines, repressuring oil sands, and similar operations, these G-MV units also have numerous industrial applications such as furnishing power, compressing air and refrigeration gases and driving generators and pumps.

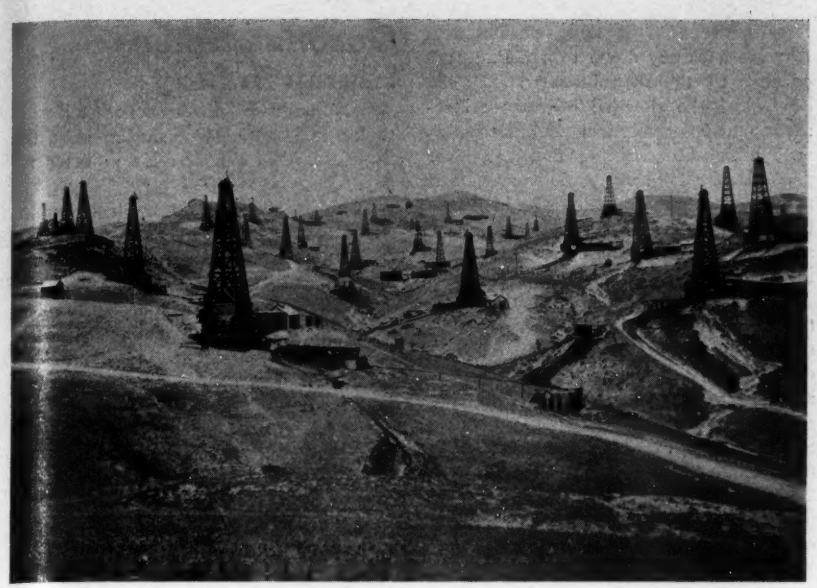
Through a preliminary bulletin issued just prior to the opening of the Exposition, the builders offer these new compressors in sizes of four, six and eight cylinders with a range of 400, 600 and 800 horsepower respectively. Copies of this Type G-MV bulletin may be secured by requests addressed to the Cooper-Bessemer Corporation offices at Mount Vernon, Ohio.

Brodie Meters Bulletin

A new bulletin, "Brodie Meters for Pipe Line Service," analyzes preventable stock and time losses in pipe line operating systems and gives applications of meters for the control, routing, blending and diversion of crude or refined petroleum stock.

Copies of the bulletin may be obtained from the Ralph N. Brodie Co., 982 61st Street, Oakland, California.

Mark Twain was not the only prospector who abandoned a claim a few feet above the rich lode. Signal Hills, as well as Kettleman, has its accounts of premature abandonments before Alamitos No. 1 brought the wonder oil field to light. The story of Signal Hills is intensely interesting, the account of its progress in engineering is revelatory. In the July 20 issue of The California Oil World, experts who know Signal Hills and the northwest extension from the beginnings will discuss the development of this great field.



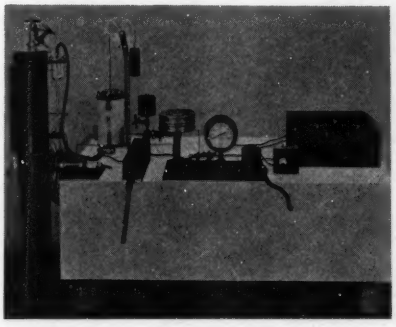
The Coalinga field as it appeared many years ago. Though the field itself is today practically unchanged, recent developments adjacent to the proven production have centered the attention of oil men on the area.

New Bottom Hole Sampler

Considerable interest was displayed by Production Engineers attending the International Petroleum Exposition, in the new Stupakoff Bottom Hole Sampler described by the sales agents, the Pittsburgh Equitable Meter Co., as new apparatus for securing and examining sub-surface samples of oil. A companion product to the Stupakoff Bottom Hole Pressure Gauge, also sold only through representatives of the Pittsburgh Meter firm, the sampler and auxiliary apparatus is said to have been thoroughly field-tested for a period of over two years prior to its first public showing in Tulsa.

The basic instrument consists of the sampler, essentially a tubular chamber open at both ends with means provided for forcibly closing the ends of the chamber, thus trapping a sample of the fluid. The total length of the device is 61 inches, with a diameter of 1¾ inches which pemits it to be lowered into tubing as small as 2 inches. The internal passages are designed to offer minimum obstruction to the flow of oil through it, so that as it is lowered into a fluid column with the valves open, it passes through the fluid without carrying any along to a lower level. The sample chamber, 42 inches in length and 1⅜ inches in diameter is closed when upper and lower knife-edged valves are thrust against fiber valve seats, by spring pressure of approximately 50 lbs. actuated by a messenger released from above. The Sampler is used both for obtaining the sample and as the container during its examination.

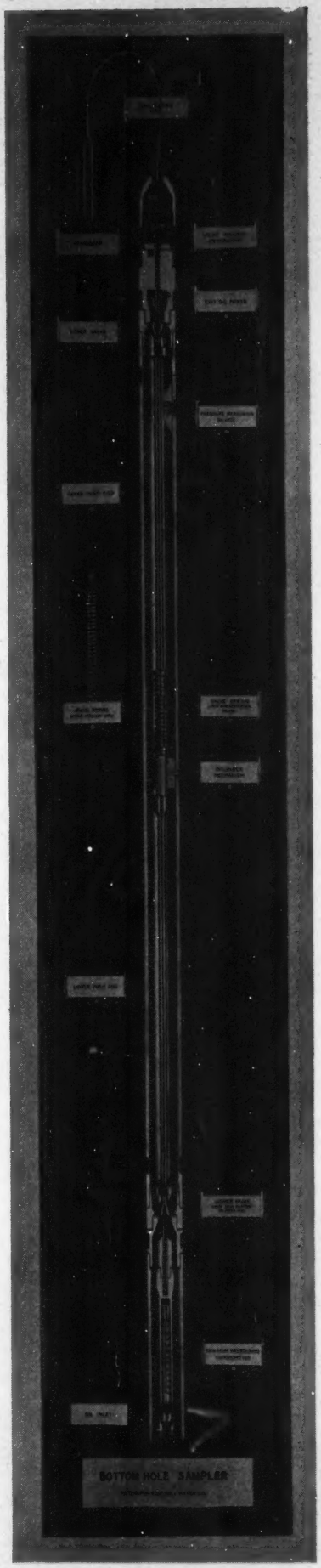
Auxiliary apparatus designed for use in the field in order to eliminate time lost in sending samples to the laboratory, includes a dead weight tester for



measuring pressures, a heater jacket for maintaining samples at a constant temperature during the tests, an extremely accurate gas meter for measuring gas volumes to within .0001 cubic feet; a mercury pump for changing the effective volume of the sample chamber by introducing mercury under pressure, together with several devices for attaching these to the Sampler.

For further information, write Pittsburgh Equitable Meter Company, 400 North Lexington Avenue, Pittsburgh, Pa.

Effective May 31, 1938, new fuel oil specifications have been announced by the National Bureau of Standards.



New Streamlined Petroleum Meter

The Smith Meter Co., Los Angeles, again broadens its line with the announcement of its "newest and smallest" product—a 1¼-in. super-accurate streamlined meter for gasoline and fuel-oil tank trucks and many other uses.

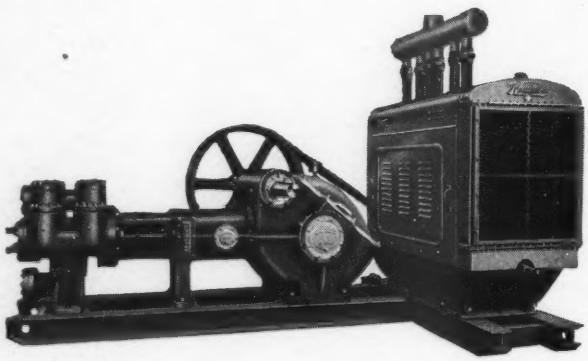
Known as Model 3T-40, this meter has a normal capacity of 40 G.P.M. and a maximum safe rate of 50 G.P.M. Rigid tests prove that it will operate with extreme accuracy down to 4 G.P.M., according to the manufacturer. It can be furnished either with horizontal reset counter or vertical dial, and also with a set-stop counter and valve for predetermined quantity delivery. For pumpers, a new air eliminator has been developed, which efficiently eliminates all air and gases before they can reach the meter.

This meter, like its companions in the Smith line, is of a rotary type without reciprocating or oscillating pistons or valves to wear and reduce the accuracy or to retard the flow. By utilizing the rotary principle of metering, continuous flow without restriction or interruption of the liquid stream is secured. The streamlined design and remarkable performance of the new meter evoked much favorable comment at the recent International Petroleum Exposition in Tulsa, where the 3T-40 was exhibited for the first time under conditions permitting demonstration tests with officially approved equipment.

"The design and manufacture of this new meter are such as to insure lasting accuracy throughout its wide range of flow", said Allan A. Floyd, president. "Moreover, this sturdy construction provides remarkably high resistance to impairment of accuracy by the severe shocks encountered in truck service."

Pipe-Line Pump of Larger Size Announced by Gaso

Gaso Pump & Burner Manufacturing Co., of Tulsa, has announced a 12-inch-stroke pump of approximately double the capacity rating of any other Gaso model. The new pump has fluid cylinders of interchangeable liner type, 4 to 7 inches in diameter, with capacities of 176 bbls. an hour at 1,500 pounds pressure, to 592 bbls. at 500 pounds pressure.



The fluid end is side-pot type, with all valves individually accessible. Assembled on skids with gasoline engine, the unit weighs approximately 24,000 pounds, representing, according to Gaso engineers, about the largest semiportable pumping plant that is practical for pipeline service.

The new pump possesses the Gaso characteristics of simplicity of design, few large parts, and rugged construction throughout. Crankshafts are journaled in Timken tapered roller bearings of exceptionally large size, and pinion-shafts in Hyatt Roller bearings. All roller bearings are sealed off from the crankcase lubricant to prevent adulteration. This new pump can be furnished by the company with any type drive, including V-belt drive to electric motor or gasoline engine, direct-shaft to engine through flexible coupling, or electric motor through chain reduction gears.

Gasoline Sales Slump in May

Gasoline sales throughout California took a substantial drop during May, the State Board of Equalization reported today.

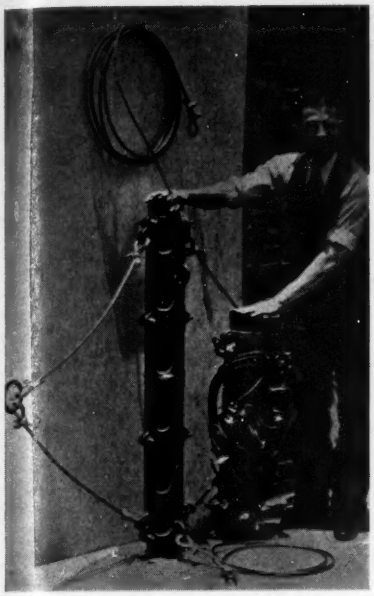
The gasoline tax for last month amounted to $4,296,311.55, or 8.24 per cent below the $4,635,695.55 assessed for the same month of 1937. The loss was approximately the same when last month's figure was compared with April of this year when a total of $4,632,373.50 was assessed in gasoline taxes.

So far this year gains have been shown by only two months.

NAME	Gallons Actually Sold	Net Taxable Gallonage
Aromalene, Inc.	744,618	604,845
Bachmann Petroleum Corp.	1,436,276	1,378,236
Bankline Oil Company	367,634	None
Barnsdall Oil Company of California	396,490	None
Belridge Oil Company	1,609,524	78,142
Brown, Henry, dba. Operators Oil & Refining	724,200	724,200
Caminol Company, Ltd., The	2,393,144	2,287,161
Chanslor-Canfield Midway Oil Co.	542,271	None
Coline Gasoline Corporation	460,134	600
Cowan Oil and Refining Co.	667,917	None
Del Rey Oil & Gas Company	805,931	None
Eagle Oil and Refining Co., Inc.	1,035,182	1,035,182
East West Refining Co.	617,679	617,679
El Camino Refining Company	878,666	823,672
Elm Oil Company, Ltd.	414,447	414,447
El Tejon Oil & Refining Corporation	699,657	683,652
Envoy Petroleum Company	820,007	820,007
Estado Petroleum Corporation.	2,118,015	2,071,374
Exeter Refining Company	1,130,486	1,130,407
Fletcher Oil Company, Inc.	2,322,470	None
F. R. Long, Inc.	1,146,460	None
General Petroleum Corporation of California	40,324,797	10,984,263
Gilmore-Dabney, Inc.	503,647	None
Gilmore Oil Company	6,235,637	122,266
Hancock Oil Company of California	4,220,637	3,586,167
Harbor Refining Company	759,035	671,187
Honolulu Oil Corporation, Ltd.	741,383	8,784
Krieger Oil Company	645,899	639,599
Lomita Gasoline Company	1,883,807	None
Los Nietos Producing & Refining Company, Ltd.	2,949,061	653,372
Macmillan Petroleum Corp.	2,700,013	2,504,178
McCallen Refining Company	985,647	900,415
Mercury Petroleum Corporation.	422,315	422,315
Mohawk Petroleum Corporation	3,544,712	3,364,948
Norwalk Company, The	2,113,855	1,718,541
O. C. Field Gasoline Corp.	2,411,243	125,611
O. F. Collinge, Inc.	793,393	None
Olsen, G. A., Receiver Sunland Refining Corporation	684,854	None
Olympic Refining Company	1,770,162	1,768,396
Pacific States Oil & Terminals Co.	2,489,704	2,029,882
Pacific Western Oil Corp.	641,030	1,083
Petrol Corporation, The	2,239,344	320,899
Petrolane, Ltd.	379,665	259,279
Richfield Oil Corporation	17,102,119	14,358,104
Rio Grande Oil, Inc.	3,988,167	None
Rothschild Oil Company	735,009	724,579
R. R. Bush Oil Company	1,229,391	1,063,058
Seaboard Oil Company of Delaware	1,477,172	None
Seaside Oil Company	3,791,884	1,326,695
Shell Oil Company	39,772,773	18,070,404
Signal Oil and Gas Company	1,453,131	None
Signal Oil Company	5,972,862	None
Socal Oil and Refining Co.	935,219	635,219
Standard Oil Company of California	67,635,368	18,096,699
St. Helens Petroleum Company, Ltd., The	1,165,022	1,164,947
Sunset Oil Company	2,518,064	None
Superior Oil Company	2,420,801	39,468
Texas Company, The	9,596,826	7,901,068
Tide Water Associated Oil Co.	28,515,002	13,526,869
Triangle Oil & Refining Co., Ltd.	636,639	636,639
Union Oil Company of California	22,127,269	13,456,928
Walter Steiner Refining Co.	587,413	587,413
West Coast Refining Company.	352,824	None
Western States Gasoline Corporation	3,714,453	193,163
Wilshire Oil Company, Inc.	7,484,825	7,221,567
White Star Oil and Refining.	369,649	369,649

New Heavy Duty Wire Line Guide

A new, heavy duty, wire line guide, designed for use on the high derricks used in drilling wells 10,000 ft. and deeper, has just been announced by Patterson-Ballagh Corp., pioneers in the introduction of the rubber lined wire line guide.

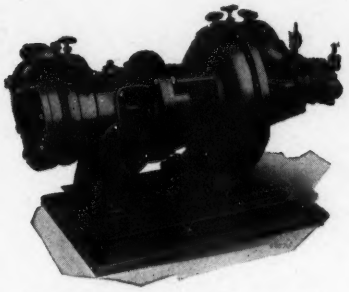


The basic principle of the Patterson-Ballagh Guide is that of a freely hanging cylinder of considerable length and weight, and this principle is of even more importance with the higher derricks. Inasmuch as the rope size is generally 1¼ inch, instead of 1⅛ inch, a greater length of rope is subject to whip; the rope speed in hoisting is greater and the greater speed of rotation increases the whipping action. The new guide is 48 inches overall in length, and weighs 125 lbs., an increase of 16 inches in length and of nearly 30 lbs. in weight. The increase in weight helps stabilize the line, and the increase in length helps to iron out the traveling waves that cause trouble and premature fatigue in spooling.

Patterson-Ballagh report actual tests show that the use of these guides gives a tremendous increase in the life of the lines, and in the safety of operations. The stabilizing effect of the longer guides will be even greater than that of the regular four section guides.

This new long guide has the same general construction as the standard, except that it has six removable or interchangeable sections instead of four, of the same rubber used in the manufacture of the Patterson-Ballagh Casing Protectors. The framework is of cast steel, equipped with an Alemite fitting, with side bridles, a suspension and a safety line. The bolts are of extra length, fitted with safety nuts, so the sections may be replaced without taking down the line. The improvements made in the guide are the result of making and studying the action of hundreds of these guides in use in all parts of the country, under all sorts of drilling conditions.

For further information address Patterson-Ballagh Corp., Ltd., 1900 East 65th St., Los Angeles, California.



Ingersoll-Rand Direct-Connected Turbine-Driven Pumps, Class "TRV"

New Turbine-Driven Pump

Ingersoll-Rand announces a unique new turbine-driven pump featuring a compact construction that combines both turbine and pump as one unit on a common shaft. This pump, known as the "class TRV" is built in single-stage sizes for capacities from 5 to 1000 gallons per minute against heads as high as 220 feet and in two stage sizes for capacities to 275 gallons per minute and heads up to 550 feet.

The featured unit assembly of pump and turbine makes possible a substantial reduction over ordinary turbine-driven pump weights and sizes. A 15-h.p. single stage unit is about 32 inches long and other sizes are proportionately small. This compactness of design not only reduces initial cost, but installation and upkeep expense as well. No special foundation is required and units are available for operation in any position. They may be bolted to the floor, wall, tank, column or ceiling, as is most convenient.

Suitable for use wherever a turbine-driven pump is desirable and replacing many older duplex steam pumps, these units are particularly applicable for for use in refineries, chemical plants, mines and other locations where hazardous gases are present. They are equally adaptable for general industrial service where process steam may be utilized, as well as for boiler feed service at boiler pressures up to 200 lbs. per sq. in. When steam is not available, the turbines can be efficiently operated on compressed air.

Additional information on these pumps is contained in bulletin 2390, copies of which may be obtained from the Ingersoll-Rand Company, 11 Broadway, New York City or any of their branch offices.

New Walworth Catalog

Walworth Catalog No. 89, a new 602-page catalog covering the complete line of Walworth valves, fittings, pipe and tools, has just been published by the Walworth Co. Many added features are embodied in the catalog which should render it of increased usefulness to engineers, contractors, plumbers, plant superintendents, purchasing agents and others interested in the Walworth line of products. In the center, for instance, is a red index permitting quick reference to each class of product listed in the book. Arrows on the red index pages point to the section markers at the beginning of each classified section. The new sizes makes possible a much less bulky format than before, so that the book is easier to handle. All of the principal items have an identifying code word for economy in cabling and telegraphing. The code words in the book are all in alphabetical order, so that messages can readily be deciphered.

Among the new sections not contained in previous catalogs are: the Marine Section; the Lubricated Plug Valve Section, with particular reference to fluids, gases and the like, with recommendations as to the types of lubricants best suited to them; the Wal-Seal Section; the Hi-Test Cast Iron Pipe Section; the Fabricated Pipe Section, containing information of value in laying out piping jobs; the Piping Design and Engineering Data Section, including many original charts helpful in figuring the sizes and types of piping necessary for particularly operating conditions; and the Soil Pipe Section.

In order to give the most comprehensive information possible on all Walworth products, the catalog specifies the type of metal used in the various parts of the valves and fittings. The Materials Section contains information concerning all types of metals used in Walworth products, complete data regarding working pressures as well as test pressures; and all the principal dimensions normally required either for laying out a job or allowing space necessary for operation of the valves.

Copies of the catalog are available to those who request them on their company letterhead. Address the Walworth Company, 600 East 42nd Street, New York, N. Y.

Business and Professional Directory

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of
CALIFORNIA

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TRinity 9705

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PETROLEUM ENGINEER
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CALIF.
MIchigan 8781

GERARD HENNY, Ph.D.
Consulting Geologist
417 S. Hill St. Los Angeles
VAndike 7053

M. H. SOYSTER
Petroleum Engineer and Geologist
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WATER DEVELOPMENT GUARANTEED

Water surveying service. David Romey, Phone Wilmington 1918, 507 Broad Ave., Wilmington, Calif. tf

REFINERIES AND GASOLINE PLANTS

Reconditioned or new heat exchangers, stills, fractionators, absorbers, condensers, at cut prices. Plants designed any size for any use. W. F. Pyne, 909 Ardmore Ave., Los Angeles. DRexel 1412. tf

PIPE

5000 ft. 10¾" O. D. Std. P. E.; 2000 ft. 12¾" O. D. Std. P. E.; 4000 ft. 5" Drill, P. E. Line; 9000 ft. 6" Drill, P. E. Line.
IMPERIAL PIPE & SUPPLY CO., 2901 Santa Fe Ave., Los Angeles. JE. 1104. tf/b

MAPS

Newly-revised map of 140,000 acres from Shafter to Gosford, in Kern Co., Calif., including Rio Bravo, Greeley, Ten-Section, Canal & Canfield Ranch Oilfields. Shows owners, leases, wells. One inch to 2,000 ft., $4.85 plus 15c tax. Similar map Wasco, Shafter, Rio Bravo & area around deep Continental well, same price. Both maps $8.74 plus 26c tax, prepaid.
Earl M. Price & Co., 1620 G St., Bakersfield, Calif. Phone 77. 7-5-d

MAPS

Large map of Los Angeles Basin oil fields and map showing all California oil fields. Price $15.00 each on paper and $20 each on cloth. Individual state oil and gas maps of Mid-Continent and Rocky Mountain regions Maps show geological cross sections at base. These maps indicate wells drilling, wells producing and abandoned, with depths.
All maps revised up to date of purchase.
JAMES C. BRANSFORD
1127 Story Bldg.
Los Angeles, Calif.
Phone: TUcker 7530

WANTED

Wanted drilling rig. Rotary or cable tools. Capacity 2,00 to 4,000 ft. Give exact condition, location and lowest cash price. Box 27, c/o Calif. Oil World 7/5-d

Oil Men's Calendar

September

5-9—American Chemical Society, Milwaukee, Wis.

14-16—Santa Barbara, Calif., annual meeting Pacific Coast Gas Association, Biltmore Hotel.

14-16—National Petroleum Assn., 36th Annual Meeting Hotel Traymore, Atlantic City, N. J.

21-23—National Industrial Advertisers Assn., Inc., 16th Annual Meeting, Cleveland, Ohio.

October

6-7—Society of Automotive Engineers, National Regional Fuels & Lubricants Meeting, Tulsa, Okla.

6-7—Petroleum Division A.I.M.E. fall meeting, San Antonio, Texas.

6-8—American Institute of Mining & Metallurgical Engineers, Industrial Minerals Division, Knoxville, Tenn.

13-15—Society of Automotive Engineers, Aircraft Production Meeting, Ambassador Hotel, Los Angeles, Calif.

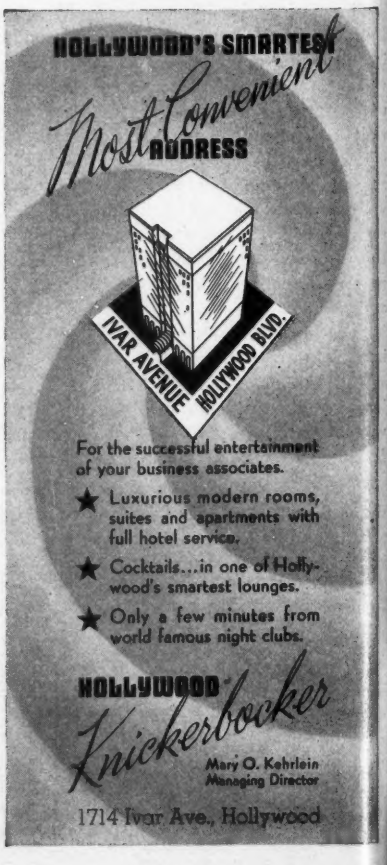
20-21—Industrial Minerals Division and Petroleum Division A.I.M.E., Los Angeles.

November

1-15—American Institute of Mining and Metallurgical Engineers Regional Meeting, Tucson, Arizona.

14—Society of Automotive Engineers, Annual Dinner, Commodore Hotel, New York.

14-18—American Petroleum Institute 19th Annual Meeting, Stevens Hotel, Chicago, Ill.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For the successful entertainment of your business associates.
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